Policy, Research, and External Affairs

WORKING PAPERS

Trade Policy

Country Economics Department
The World Bank
March 1991
WPS 629

An Atheoretic Evaluation of Success in Structural Adjustment

Patrick Conway

Countries that followed a prescription of relatively low government spending, deep financial markets, and outward orientation in trade policy performed significantly better than those that did not when countries are ranked by adjusted economic performance.

Policy, Research, and External Affairs

WORKING PAPERS

Trade Policy

WPS 629

This paper — a product of the Trade Policy Division, Country Economics Department — is part of a larger effort in PRE to identify empirical regularities in the nexus of economic performance and government policy for developing countries. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Dawn Ballantyne, room N10-025, extension 37947 (63 pages, with tables).

Conway presents and implements a methodology for assessing the success of structural adjustment based on a "fixed effect" methodology.

He examines data for 75 countries over 11 years. Performance indicators include measures of inflation, economic growth, external balance, and physical investment. He measures government policies in terms of spending, trade regime, financial deepening, and real exchange rate policy.

The empirical estimates he obtains suggest that ranking countries by adjusted economic performance yields significantly different results than ranking them by historical performance.

Further, countries following a prescription of relatively low government spending, deep financial markets, and outward orientation in trade policy performed significantly better than those that did not.

This prescription was correlated significantly with more rapid economic growth, current accounts with lower deficits, expanded investment, and reduced inflation.

Produced by the PRE Dissemination Center

Table of Contents

I have benefited in the research underlying this paper from the financial support of World Bank Research Grant 675-32 and the hospitality of the External Adjustment Division of the IMF Research Department, although neither is to be implicated in the conclusions reached. Thanks as well to Bela Balassa, Jaime de Melo, Lant Pritchett and Dani Rodrik for their comments, and to participants in seminars at the World Bank, North Carolina State University, the University of Florida and Harvard University. Jeff Konz provided excellent research assistance.

I. Introduction.

Successful structural adjustment programs are a stated goal of many developing-country governments. International financial institutions such as the World Bank and International Monetary Fund have made structural adjustment a major target of lending policy. The US government enshrined structural adjustment as the centerpiece of its recommendations to indebted countries in the Baker and Brady Plans. Despite this importance, however, there is not yet a consensus on a definition of structural adjustment or on an appropriate measure of success in structural adjustment.[1] In this study I propose a definition and measurement of structural adjustment, suggest a methodology for identifying those policies conducive to successful structural adjustment, and implement these measures and methodologies for a panel of 75 developing countries over an 11-year period.

Structural adjustment is often put forward in the rhetoric of free markets. However, as with its predecessor the stabilization program, its roots are more likely found in the integration of developing countries in the world economy. Stabilization programs arose because of inconsistency between internal policies and external balance in developing countries. In external balance, current account deficits are offset by sustainable private and official capital flows. As documented in Cline and Weintraub (1983) and Williamson (1983), stabilization programs were implemented in countries characterized by non-sustainable capital flows and were designed to re-establish external balance in the short run through demand management even at the cost of economic growth. Structural adjustment programs, by contrast, are based upon the need in the medium and long run to maintain external balance but to sustain positive economic growth and development.[2]

Structural adjustment is thus a reallocation of resources to best compete in and take advantage of the world environment. Such reallocations are necessary because the world economy has changed greatly for developing countries since the mid-1970s. Prices of crude oil have quadrupled and then halved in real terms; real interest rates have varied from substantially negative values to substantially positive values; international credit availability for many of these countries has gone from ample to non-existent.

Despite the stated importance of structural adjustment, there is little agreement on how best to measure it. One method is to examine the policies undertaken by the developing-country governments. If these policies accord with the observer's theory for how structural adjustment is to be fostered, then there is a presumption of structural adjustment. This is most clearly the case in the examples of trade liberalization policies: since trade barriers serve to protect the initial economic structure, their removal will lead to structural adjustment impelled by market forces. In this instance, the implementation of the policies is viewed as the indicator of successful structural adjustment. A second method uses actual economic performance as a gauge for the success of structural adjustment. This method is atheoretical and teleological: if a country performs well in the transition from one world economic environment to another, then it exhibits successful structural adjustment. In the example above, the trade liberalization would not be the evidence of structural adjustment: rather, the improvement of the current account would be.

I define and implement the second methodology in this paper. As measures of economic performance I consider the growth rate in real gross

domestic product (GDP), the domestic consumer inflation rate, the ratio of the current account balance to gross national product (GNP) and the ratio of domestic investment to GNP. The first two provide an indication of the internal balance of the economy, while the remaining are indicators of external balance and intertemporal balance, respectively. "Performing well" is defined in relative terms in the context of a cross-country comparison of performance. The few studies implemented using this method[3] have neglected an important feature: they have implicitly assumed that all developing countries faced the same world economic environment. This leads to a biased measure of "performing well"; for example, some countries may have been favored by terms-of-trade movements while others were penalized. An unbiased measure will control for these differences in external environment. Performance is also measured as an average across the ten-year period 1977-86. A country experiencing a mixture of high growth and deep recession during the period (e.g., Turkey or Chile) will thus have both episodes factored into its measure of performance. A "fixed-effect" methodology is adapted to deal with the econometric problems particular to this type of time-series cross-sectional analysis.

The empirical estimates obtained from implementing this technique suggest the following conclusions:

(1) Ranking countries by historical economic performance (e.g., economic growth, current account behavior, investment behavior) does not incorporate the differing exigencies of external environment facing the different countries. Once performance is adjusted for external factors, the rankings of relative success are altered dramatically.

(2) Hypothesis testing reveals a clear distinction between countries following a prescription of relatively low government expenditure, deep financial markets and outward-orientation in trade policy and those that do not. This "Classical" prescription

was correlated in our samples to greater success in economic growth, current account improvement, investment expansion and inflation reduction as well as in measures of income distribution.

These conclusions are amplified and extended in the following sections of the text. In the second section I describe the technique for adjusting economic performance to reflect the external environment and discuss the available data. The third section presents in summary fashion the statistical results. The final section presents conclusions and suggestions for extending the analysis.

II. Accounting for the External Environment.

Measures of economic performance will respond systematically to four sets of determinants: external incentives, secular economic development trends, economic policy choices and country-specific structural factors. The observed historical performance will be attributable to all of these factors, and thus observed success could be due either to stimulative economic policy choices or to the serendipity of a favorable external environment. From the country's point of view, of course, either is welcome. However, for purposes of identifying economic policies successful in structural adjustment it is important to decompose performance into that part attributable to policy and structure and that part due to external incentives or secular trends. The former will provide a useful cross-country measure of successful structural adjustment. In the following parts I discuss the methodology and the data used in this analysis.

Methodology.

The systematic relationship between performance and environment can be represented in reduced form for country i in period t (t = 1,2,...,T) as:

$$(1) \qquad Y_{it} = a_i^* + X_{it}b_i + S_{it}c_i + P_{it}g_i + \epsilon^*_{it}$$

a_i^* is a measure of systematic country-specific contribution to economic performance. The three data matrices -- X_{it}, S_{it} and P_{it} -- include time series of variables measuring incentives (and disincentives) to economic performance. The external incentives in X_{it} can be either price-based (e.g., terms of trade, real interest rate) or macroeconomic (e.g., world demand, debt burden) in nature. The columns of S_{it} and P_{it} measure secular economic trends and policy choice respectively. ϵ^*_{it} is the random component and is assumed independently distributed across time periods. b_i, c_i and g_i are conformable vectors measuring country-specific responses to these incentives.

There are three important elements of country-specific behavior that can be decomposed in this analysis. First, a large a_i^* in comparison with other countries indicates country-specific success given a stable international environment. Second, the country's economic structure as captured in (b_i, c_i, g_i) can be relatively more or less successful in responding to changes in the environment. Third, government policy (P_{it}) can be more or less flexible in responding to changes in the environment.

I illustrate the first two elements by transforming equation (1) to introduce a "normal" structural response to changes in the environment denoted by the vectors b, c and g for T periods.[4]

$$(2) \qquad Y_{it} = a_i + X_{it}b + S_{it}c + P_{it}g + \epsilon_{it}$$

$$\text{with } a_i = a_i^* + [\bar{X}_i(b_i - b) + \bar{S}_i(c_i - c) + \bar{P}_i(g_i - g))]$$

$$\epsilon_{it} = \epsilon^*_{it} + (X_{it} - \bar{X}_i)(b_i - b) + (S_{it} - \bar{S}_i)(c_i - c) + (P_{it} - \bar{P}_i)(g_i - g)$$

$$\text{and} \qquad \bar{W}_i = [\Sigma_t W_{it}]/T \qquad \text{for all variables } W_{it}.$$

The intercept a_i includes two effects. The first, given by a_i^*, represents idiosyncratic country performance abilities. The second, given by the terms in $\bar{X}_i$, $\bar{S}_i$ and $\bar{P}_i$, indicates the country's structural flexibility in adjustment to secular evolution or external and policy shocks compared with the "normal" response. The terms in b, c and g are the "normal" responses to country i's economic environment. The error term ϵ_{it} incorporates the random error and the cross-period variability in country-specific response. Given the definitions of the time-series means the error term ϵ_{it} has an expected value of zero; however, it may exhibit cross-period autocorrelation.

The term "normal" is used as in the seminal work of Chenery and Syrquin (1975) in a descriptive rather than normative sense. A normal response can be defined as an average structural and policy response to the external environment. Least-squares regression is used to derive this average response. Suppose that there are M countries (i = 1,2,...,M). Stack the vectors Y_{it} into the (MTx1) column vector $Y_t = [Y_{1t}' \; Y_{2t}' \; \ldots \; Y_{Mt}']'$. Stack the vector ϵ_{it} and the matrices X_{it}, Z_{it} and P_{it} similarly. Define a block-diagonal intercept matrix A_i with dimension (MTxM) and the mth block consisting of a (Tx1) vector of a_m in the mth column. Least-squares

regression can be used to derive estimates of b, c, g and the country-specific a_i as in equation (3).[5]

$$(3) \qquad Y_t = A_i + X_t b + S_t c + P_t g + \epsilon_t$$

Although the technique introduces some econometric complexities, it allows identification of economic performance by country corrected for the hospitality (or lack thereof) of the external and policy environment.[6] This measure of economic performance will serve as the basis of cross-country comparisons of success in structural adjustment.

The government policy choice P_{it} is a third component of country-specific economic performance. It is also an endogenous decision, and can be represented by a reaction function. Observed policy will then have the characteristics in equation (4), with an autonomous (and country-specific) component G_i, a component induced by external and secular variables ($X_{it}p_{ix} + S_{it}p_{is}$) and a random component ν^*_{it}.

$$(4) \qquad P_{it} = G_i + X_{it}p_{ix} + S_{it}p_{is} + \nu^*_{it}$$

This can be rewritten using a decomposition as above to highlight the normal and country-specific aspects of this policy choice. q_i is the country-specific component of policy choice that is of interest, while ν_{it} is the random component. p_s and p_x represent normal policy reactions to external and secular shocks, respectively.

$$(5) \qquad P_{it} = q_i + X_{it}p_x + S_{it}p_s + \nu_{it}$$

with $q_i = G_i + \bar{X}_i(p_{ix}-p_x) + \bar{S}_i(p_{is}-p_s)$

and $\nu_{it} = \nu^*_{it} + (X_{it}-\bar{X}_i)(p_{ix}-p_x) + (S_{it}-\bar{S}_i)(p_{is}-p_s)$

When equation (5) is substituted into (1), the fixed-effect estimation equation can be rederived in substantially the same form as in (2).

(6) $Y_{it} = \alpha_i + X_{it}\beta + S_{it}\gamma + \eta_{it}$

with $\alpha_i = a_i + q_i g$
$\beta = b + p_x g$
$\gamma = c + p_s g$
$\eta_{it} = \epsilon_{it} + \nu_{it}$

These matrices can be stacked as in preparation of equation (3) to allow fixed-effect estimation of α_i, β and γ.[7] α_i will thus capture all three components of country-specific economic performance outlined above.

The gist of the method can be presented in Figure 1. Suppose that the economic performance measure of interest is the current account/GNP ratio (C), and that Countries A and B have observed (negative) ratios of C_A and C_B, respectively, in this period. The two countries have observed terms-of-trade in that period of T_A and T_B, respectively, and otherwise face an identical external environment. C_A is less than C_B, so that an initial examination of the evidence suggests that B has a more successful external-account performance than A. However, there is a normal relationship observed historically between the terms of trade for a country and its current account: as the terms of trade improve (T rises) so also will the current account.[8] This normal relationship is illustrated in Figure 1 by the slope of the line C(T).

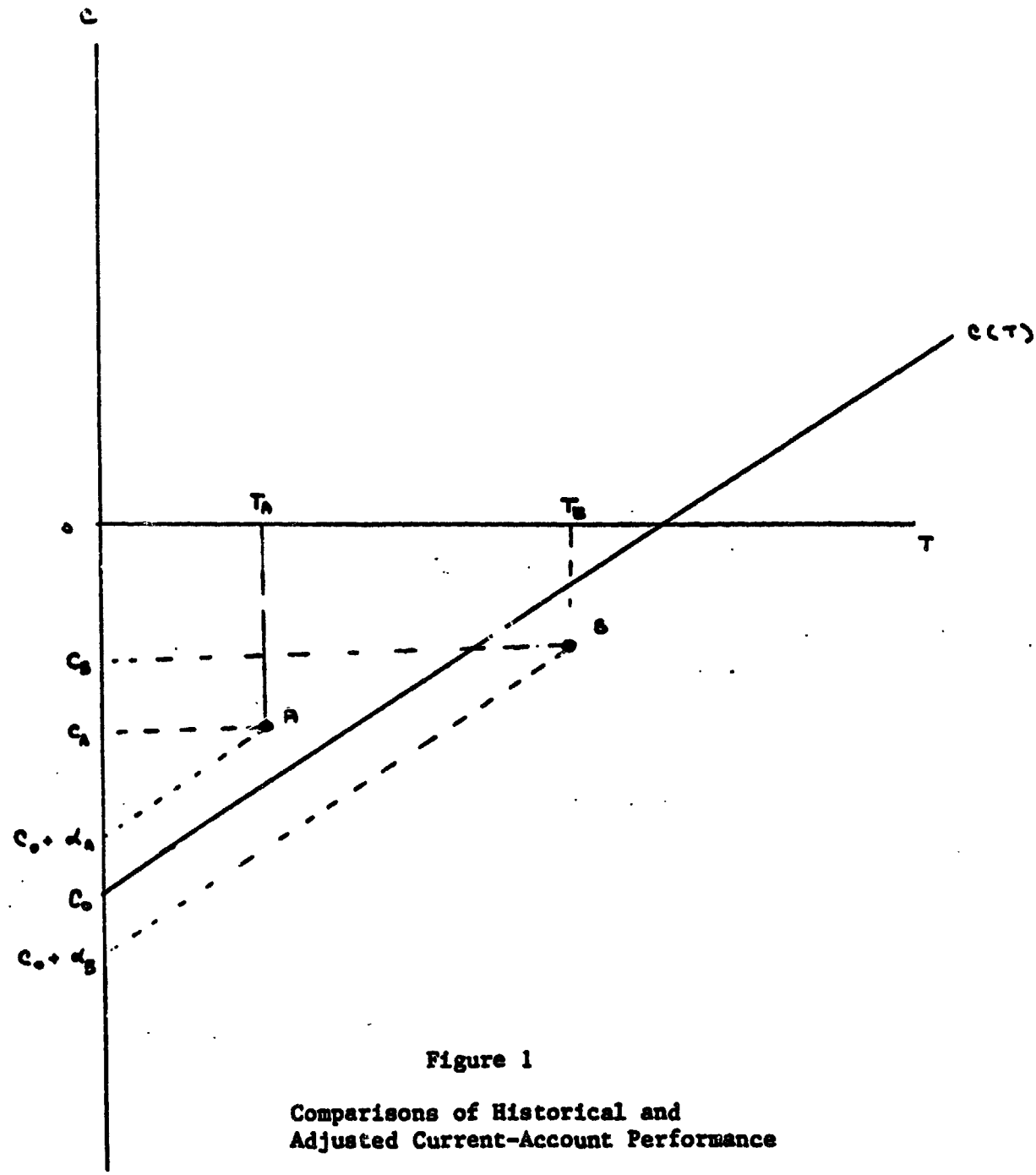

Figure 1

Comparisons of Historical and
Adjusted Current-Account Performance

To adjust for the external environment, both countries' performances should be evaluated as if they faced the same terms of trade. By doing this, the comparison is corrected for external differences and focuses on policy and structural differences between the economies. In Figure 1 this comparison is made by projecting points A and B onto the vertical axis using the slope of the normal relationship. This projection could be done to any common terms of trade -- in the empirical section of this study I derive a normal value of T for this evaluation. The adjusted current account performance for A and B is defined relative to C_o and is given by the measures α_A and α_B. It should be clear from the figure that the value of C_o is not of importance in comparisons of adjusted performance. As the figure indicates, the ranking of adjusted performance for countries A and B is reversed from the historical ranking -- country A was more successful than the norm in dealing with a deteriorated terms of trade, while country B was less successful given its elevated terms of trade. If third countries were looking to this pair for guidance on improving current account performance, they would do well to choose country A as the exemplar despite its lower observed current account ratio.

The terms of trade is for most developing countries a relative price outside their control. Once determined, it has a direct effect on economic performance -- not only on the current account, but for economic growth, investment, inflation and other measures. It and other such variables define an environment within which the developing country must operate. The country's success will be relative to that constraint. Among the variables treated as external constraints in the empirical section are the real interest rate, the terms of trade, the country's level of economic

development (as proxied by the share of agricultural output in total output), and its previous accumulation of external debt.[9] They define the field on which economic policy will play, and thus the economic policy will be judged relative to the condition of the field.[10]

Government policy will have direct and indirect effects on country success (or lack thereof) in stabilization and structural adjustment, but will itself be dependent upon the external environment. I focus on three policy instruments often identified with stabilization and structural adjustment programs: the real exchange rate, the ratio of government current spending to GNP and the degree of financial deepening of the economy. Economists since Salter (1959) and Swan (1963) have identified use of the real exchange rate and government spending with attainment of internal and external balance. Positive domestic real interest rates have been more recently identified as incentives to increased domestic investment through the channel of financial deepening as first discussed by McKinnon (1973) and Shaw (1973). More recently, descriptions of structural adjustment as a strategy have noted its reliance on relative price movements to provide appropriate incentives to private actors (see, e.g., Reisen (1985), Conway (1987) and Celâsun and Rodrik (1989)). Consideration of the real exchange rate and the degree of financial deepening addresses the fundamental relative prices of foreign to domestic goods and of consumption to saving.[11] Correction for the external environment through regression analysis will leave a country-specific component to policy that can be used to estimate a policy position for each country. This position will be defined relative to a normal policy stance in a manner analogous to that of the performance measures.

Once the adjusted performance indicators are derived I compare them across countries in two ways. Statistical tests are performed to see what countries stand out as relatively greater or lesser successes in each dimension of economic performance, and then their chosen policies (also adjusted for the economic environment) are examined for similarities. Chi-square statistics from contingency tables and Spearman correlation analysis are also used to identify common rankings of countries by their country-specific economic performance. These comparisons of rankings are non-parametric but permit an identification of common elements in the policy-performance nexus across countries.

Data.

I have assembled data for 75 countries from the 1989 World Tables and World Debt Tables of the World Bank; the characteristics and precise definitions of these data and countries are given in the appendix. The measures of economic performance examined in this study include the growth rate in real output (YGR), the inflation rate (DINF), the current account/GNP ratio (CAR) and the domestic investment/GNP ratio (IR). These are not exhaustive, but reflect performance along a number of dimensions important to the developing country. YGR and DINF are indicators of internal balance: success in structural adjustment occurs when resources are being allocated efficiently and with little excess demand. CAR measures performance in attaining external balance; structural adjustment has most recently required adjustment to limited access to international credit, and this variable measures relative success in that. IR is a measure of intertemporal balance: even though policies and external events may

stimulate growth and adjustment, this will not be sustainable without a concomitant expansion in productive capacity.

I have collected as well comparable data on economic policy choices in these countries. The ratio of government current expenditure to GNP (GOVGNP) is a measure of fiscal policy stance. The ratio of money, broadly defined, to nominal GNP (MON) is an indicator of the monetization and financial deepening of the economy. The normalized real exchange rate index (RERA, RERB) illustrates government's efforts to maintain competitiveness in international trade. The trade regime index (TRAREG) is drawn from rankings provided in World Development Report 1987 and measures the overall outward orientation of the economy.

The environment within which structural adjustment policies are made and economic performance is attained is characterized by the country-specific realizations of the external variables cited above. The real international interest rate (RR) is defined ex post by subtracting the US inflation rate from the country's average nominal rate on international borrowing. International debt is total debt, including private, public and publicly guaranteed, deflated to billions of 1980 US dollars. It is stated in per capita form, and is divided into a longer-term component (LTDPC) and a short-term component (STDPC).[12] The terms of trade (TOTA, TOTB) is the ratio of average export to average import prices normalized as described in the appendix. It is likely that there are other common international influences on economic performance in these countries as well, and to measure the influence of these I introduce a series of year-specific dummy variables (D7 for 1977 through D5 for 1985) as explanatory variables. These will register, for example, the growth in world real demand for imports or

the impact of restrictions on international credit that as Sachs (1989b) documents were imposed in the post-1982 period.[13]

The share of total output produced in the agricultural sector (YASHR) is a proxy variable inversely related to the country's secular stage of economic development.

Least-squares estimation is used to calculate the normal response of performance and policy measures to the external environment and to derive the appropriate country-specific adjusted measures. The intercept is set so that at panel averages of the external factors the equation generates the average, or norm, of the dependent variable. The other fixed-effect coefficients in the regression results represent the deviation of country-specific performance from that normal performance.

Given the cross-country and time-series nature of the panel data, it is reasonable to expect elements of both heteroskedasticity and country-specific serial correlation in the errors. Use of least-squares estimation techniques will assure unbiased estimates of the parameters even in the presence of these elements. However, the variance-covariance matrix of coefficient estimates must be corrected to test hypotheses about these estimates. The results presented below incorporate these corrections, and the correction methodology is presented in detail in the appendix.

III. Comparing Historical and Adjusted Economic Policy and Performance.

There are two important sets of statistics that result from of the "fixed-effect" regression analysis. The first are the coefficients of the external-environment variables: these indicate the extent of commonality of developing-country response to external shocks. The second are the

coefficients of the country-specific dummy variables: these "fixed effects" are the adjusted measures of country-specific performance and policy. The latter are amenable to two different methodologies for correlating performance measures with one another and with the policy measures undertaken. The first method takes a country perspective, and compares those countries that had performance significantly different from the norm to identify any common characteristics of that performance. The second examines correlations of policy position and structural adjustment performance across countries. Chi-square statistics from contingency tables and Spearman rank correlation coefficients are used to identify statistically significant groupings of countries within the sample. In this second methodology it is also possible to introduce country performance for areas in which annual data are not available. It is useful to define a specific policy strategy including deep financial markets, outward orientation, a depreciated real exchange rate and relatively low current expenditure ratio as a Classical prescription. The results that follow will provide evidence of a link between successful structural adjustment and the Classical prescription.

The Normal Response to External Shocks.

Table 1 presents the results of the five generalized least squares (GLS) regressions of structural performance variables on external variables and "fixed effect" terms.[14] These provide strong intuitive support to the notion of a normal response to the external environment.

The explanatory equation for economic growth illustrates quite plausible normal relations between the external environment and growth performance. Each standard-deviation improvement in the terms of trade is

associated with an additional .88 percentage points in growth, while each percentage point increase in the real interest rate facing a country is correlated with a .2 percentage point fall in economic growth. Both long- and short-term debt burdens reduce economic growth significantly; each $1 increase in per capita debt is associated with a fall on average of 2.4 and 8.0 percentage points in the growth rate. All of these effects except that of long-term debt are significantly different from zero at the 95 percent level of confidence, and that coefficient is significant at the 90 percent level. Year-specific dummy variables were not jointly significant in this regression at the 90 percent level.

The domestic inflation regression picks up a number of interesting cross-country characteristics of inflation generation. First, there is no evidence of transmission of inflation from developed to developing countries, even controlling for other external factors. The US inflation rate, as a proxy for world inflation, has a negative coefficient in the equation -- during this period as the US inflation rate came down the domestic inflation rates rose on average. Ceteris paribus, the least-developed countries have significantly higher inflation rates. Increases in real interest rates on external borrowing are associated with significantly lower inflation, while increased debt burdens are associated with significantly higher inflation. Terms of trade improvements are correlated with higher inflation, but only insignificantly so.

The CAR regression results do not accord well with the predictions of the balance of payments constraint. As expected, an improvement in the terms of trade is correlated with a significant improvement in the current account. However, the real interest rate and real per capita debt variables

Table 1

Impact of Environment on Adjustment Performance

	YGR	DINF	CAR	IR
Intercept#	4.070	-1.62	-8.60	28.00
USINF		-0.561*		
YASHR	0.037	0.755**	0.082	-0.225**
TOTB	0.881**	1.015	1.645**	0.385**
RR	-0.180**	-0.845**	0.061	-0.102*
LTDPC	-2.402*	18.567**	8.393**	-8.473**
STDPC	-8.015**	3.916	2.708	-3.599
D7			-0.581	1.345**
D8			-0.979	2.048**
D9			-0.524	1.877**
D0			-1.803**	2.189**
D1			-2.149**	2.319**
D2			-2.421**	1.367**
D3			-0.498	-0.233
D4			-0.308	-0.070
D5			0.099	-0.505
Summary statistics:				
R^2	0.46	0.64	0.63	0.90
F value	7.12**	14.25**	12.09**	63.47**

- Intercept was not estimated. It was chosen to center fixed-effect terms around a median of zero.
** - Significant at 95 percent level of confidence.
* - Significant at 90 percent level of confidence.

have positive coefficients; the balance of payments identity suggests that these should be negative. The only one of the three significantly different from zero is that associated with long-term debt, and that may be due to the investment uses of that debt generating exportable or import-competing product.[15] The year-specific dummy variables indicate a sample-wide ability to sustain larger negative current-account ratios in years previous to 1986 than in 1986 itself. This ability was most pronounced in the period 1980-1982; in that year the sample average current-account ratio was ceteris paribus 2.4 percentage points more negative than in 1986.

The investment ratio regression accords well with economic intuition. A more industrial economy (as indicated by a decline in agricultures share in output) is significantly correlated with a larger investment ratio; so also is an improved terms of trade. Higher real interest rates, short-term and long-term debt burdens are all associated with reduced investment ratios. An increase of one percentage point in the real interest rate is correlated with a fall of .1 percentage points in the investment ratio, while $1 increases in per capita debt are associated with reductions of the investment ratio of 3.6 to 8.5 percentage points. The year-specific dummy variables indicate a sample-wide tendency toward higher investment ratios during the pre-debt crisis period. In 1981 the average investment ratio was ceteris paribus over 2 percentage points higher than in 1986, while in the 1983-1985 period investment ratios were on average only slightly above that of 1986.

These regressions indicate the importance of the external environment to the adjustment performance of the sample countries. Improved terms of trade are significantly associated with improved economic growth, investment

and the current account. Further, an increased burden of international debt contributes significantly to slower economic growth, higher inflation and lower investment ratios. Higher real interest rates on international borrowing are also associated with lower economic growth and the investment ratio. The significant coefficients on country-specific dummy variables suggest that other external factors not explicitly accounted for in the regression are important in understanding external and intertemporal imbalances.

There is as well a normal impact of the external environment on the policy structure of economies. Table 2 examines these common impacts for current government expenditure (GOV), the index of financial deepening and a normalized real exchange rate index (RERA).

MON, money broadly defined, is an indicator of financial deepening in the economy.[16] As McKinnon (1973) suggested, non-inflationary monetization of the economy may increase efficiency in allocation of goods while increased use of other financial instruments may improve efficiency in allocation of saving. This ratio will register both, but will exclude monetization leading only to inflation. The regression results suggest that financial deepening is associated with higher world real interest rates and with higher per capita international debt. There has been as well a sample-wide tendency toward financial deepening, with ratios in 1986 being on average over 3 percentage points higher on average than in 1977.

Government current expenditure as a share of GNP is rising with level of development. It is falling with improvements in terms of trade, perhaps because social expenditures need increase less rapidly than GNP as the terms

Table :

Impact of Environment on Adjustment Policy

	MON	GOV	RERA
Intercept#	38.20	19.10	21.40
YASHR	0.041	-0.150**	0.844**
TOTB	-0.332*	-0.382**	-1.554**
RR	0.329**	0.058**	0.155
LTDPC	8.871**	-0.544	-4.407
STDPC	8.896**	0.927	15.433*
D7	-3.070**		2.318
D8	-3.030**		0.399
D9	-2.695**		1.648
D0	-2.266**		0.718
D1	-2.027**		3.988**
D2	-1.788**		4.339**
D3	-1.477**		4.006**
D4	-0.738		4.055**
D5	-0.422		4.306**
Summary statistics:			
R^2	0.91	0.97	0.82
F value	76.52**	232.18**	31.88**

- The intercept was not estimated, but was chosen to center the fixed-effect terms around a median of zero.
** - Significant at 95 percent level of confidence.
* - Significant at 90 percent level of confidence.

of trade improve. Higher real interest rates and increased short-term international debt are associated with an increase in GOV, while higher long-term debt is negatively correlated. The non-debt coefficients are significant at the 95 percent level of confidence.

The real exchange rate has a sensible relation to the external environment.[17] RERA is defined to be appreciating as it rises. It is increasing in YASHR, indicating that the least-developed countries are those with the more appreciated real exchange rates, ceteris paribus. Improvements in the terms of trade are associated with depreciation of the real exchange rate; this suggests that nominal exchange rate choice is not the dominant determinant of the real exchange rate, since real depreciation due to nominal depreciation should also be correlated with terms-of-trade deterioration. Short-term debt is also significantly associated with real appreciation, as countries have been able to finance current account deficits and maintain real appreciation. There is evidence of sample-wide real appreciation during the period 1981-1985 after other factors have been controlled for, with a sharp average real depreciation in 1986.

The evidence of Table 2 suggests that adjustment policy in the period under consideration was quite responsive on average to the external environment. Financial deepening was clearly associated with greater reliance on international debt and with higher world real interest rates. Government current expenditure appeared to move counter-cyclically with terms of trade improvements while of necessity rising with real interest charges. The real exchange rate demonstrated the financing-adjustment tradeoff by maintaining a greater appreciation for countries and periods with greater short-term international debt.

Country-specific patterns: chi-square tests.

The fixed-effect regressions underlying Tables 1 and 2 not only define the normal response to the external environment but also provide country-specific measures α_i. Analysis of the α_i permits identification of patterns in the cross-country incidence of success at structural adjustment and policy implementation. I consider two non-parametric statistical tests for patterns: chi-square statistics from contingency tables and Spearman rank correlation coefficients.

The most general use of the information embodied in the α_i is possible through examining their values relative to the normal value of zero. It will be evidence of a significant linkage between policy and successful performance if positive α_{Ii} in investment performance, for example, is disproportionately correlated with positive α_{Mi} in financial deepening. The significance of such a relation is measured through the contingency table: each cell corresponds to the number of times possible combinations of α_{Ii} and α_{Mi} occur in the estimation results. For example, the α_i observed in estimation had the pattern given in Table 3: this pattern is sufficiently disproportionate that a chi-square test rejects the null that no pattern is present in the underlying population at the 95 percent level of confidence. The pattern evident in the data is that positive α_{Mi} occur disproportionately often with positive α_{Ii}, and similarly for negative values: this is evidence of the importance of financial deepening to investment success.

Similar chi-square statistics can be calculated for each pair of performance and policy variables, and a summary of these results is reported in Table 4. These indicate a number of intriguing policy/performance

Table 3

Contingency Table and Chi-Square Statistic
IR Performance by MON

Contingency Table

		α_{Mi}		
	FREQUENCY PERCENT	< 0	> 0	TOTAL
α_{Ii}	< 0	25 33.33	13 17.33	38 50.67
	> 0	14 18.67	23 30.67	37 49.33
	TOTAL	39 52.00	36 48.00	75 100.00

Chi-Square Statistic

Value	5.868
Degree of Freedom	1
Probability of Random Underlying Distribution	0.015
Sample Size	75

Table 4

Summary of Results: Chi-square statistics from contingency tables

Variables	χ^2	Prob value	Direction of correlation
YGR by MON	2.962	0.085	positive
by GOV	3.099	0.078	negative
by RERA	0.013	0.909	
by COMP	6.676	0.463	
DINF by MON	0.111	0.739	
by GOV	4.945	0.026	negative
by RERA	3.448	0.063	positive
by COMP	9.403	0.225	
CAR by MON	0.017	0.897	
by GOV	13.058	0.000	negative
by RERA	2.595	0.107	
by COMP	21.458	0.003	
IR by MON	5.868	0.015	positive
by GOV	2.987	0.084	positive
by RERA	0.013	0.909	
by COMP	5.243	0.630	

The statistic reported is the chi-square value calculated by forming the contingency table of positive and negative α_i for the two variables named. The final column is the direction of disproportionate correlation if significant: for example, in the correlation of α_{Yi} from the YGR equation and α_{Mi} from the financial deepening equation positive values occurred disproportionately with positive values and similarly for negative.

Each statistic has 1 degree of freedom, except those of variables with COMP; these have 7 degrees of freedom. There are 75 observations for all variables except GOV (74 observations) and RERA (65 observations).

COMP is a variable with eight values; each one corresponds to a different permutation of policy realization relative to the norm (example: COMP=1 implies above-normal financial deepening, above-normal current expenditures and a real appreciation relative to the norm). A significant chi-square value indicates that the policy mix realized significantly affected the performance realized.

Table 5

Summary of Results: Chi-square statistics from contingency tables
Significant α_1 only

Variables		χ^2	Observations	Direction of correlation
YGR	by MON	13.80	14	Positive
	by GOV	1.78	15	
	by RERA	0.25	4	
CAR	by MON	0.16	10	
	by GOV	4.94	9	Negative
	by RERA	1.07	3	
IR	by MON	64.00	22	Positive
	by GOV	13.44	23	Positive
	by RERA	2.04	7	
DINF	by MON	0.00	5	
	by GOV	0.00	6	
	by RERA	0.00	3	

Critical values for chi-square with one degree of freedom:

2.71 at 90 percent level of confidence
3.84 at 95 percent level of confidence

There were no measures of domestic inflation performance significantly less than the norm of 20.00 chosen; as a result, these chi-square values were necessarily zero.

interrelations. Using the 90 percent level of significance, there is a significant correlation between above-normal economic growth performance and above-normal financial deepening, and also between below-normal economic growth and above-normal current government expenditures. Above-normal current-account performance is negatively correlated with government current expenditure. Above-normal domestic inflation is significantly associated with real appreciation, as expected; and also with above-normal current government expenditures. The positive correlation between investment performance and financial deepening was remarked upon earlier; also evident is a positive correlation between investment and government current expenditure performance. There is a significant difference among policy mixes in achieving above-normal performance only in the case of the current account.

The chi-square statistics can be recomputed using only those α_i significantly different from zero in the underlying regressions. These are less reliable statistics because of the lower number of observations, but they reinforce the conclusions of the complete sample.[18] Table 5 reports these results. Above-normal economic growth is positively and significantly associated with financial deepening. Current-account performance is negatively associated with high current government expenditures. Above-normal investment performance is correlated with above-normal financial depth and with above-normal government current expenditure.

The associations of these two tables suggest an assignment of policy to performance targets. Financial deepening is positively correlated with real investment and with economic growth. Real current government expenditures

do best by doing least as evidenced by their negative correlations with economic growth, current account performance and inflation.

Country-specific patterns: Spearman correlations.

The second non-parametric methodology for analysis of the fixed-effect results is through Spearman rank correlation statistics. The contingency tables use relatively little of the information inherent in the α_i. The Spearman rank correlation coefficient measures the correlation in the ranks (i.e., position among the 75 countries) of countries' adjusted policy and structural adjustment performance. It is a nonparametric technique that places weight not on the absolute values of estimated coefficients but on their relative sizes.

Spearman rank correlation coefficients are presented in Table 6 for the adjusted performance measures derived from fixed-effect estimation. The patterns uncovered in the contingency tables remain, while others less visible there emerge. For example, relative success in economic growth as measured by adjusted rankings is positively and significantly related to financial deepening, to below-normal government current expenditure and to above-normal investment performance. Rather than having growth fueled on average by large current account deficits or large current government expenditures during this period, there was on average a tendency to greater adjusted economic growth from those with more balanced adjusted current accounts and limited current expenditure ratios.

Success on the adjusted current account is negatively and significantly correlated with the two adjusted absorption measures and positively correlated with the measure of output, reflecting the income-absorption interpretation of the current account. Current-account performance has a

Table 6

SPEARMAN CORRELATION COEFFICIENTS
(75-country sample)

	YGR	CAR	IR	MON	GOV	DINF
YGR	1.00000	0.11963	0.43852	0.23829	-0.24052	0.15397
	0.0000	0.3066	0.0001	0.0395	0.0390	0.1872
CAR	0.11963	1.00000	-0.29869	-0.02088	-0.30053	0.29690
	0.3066	0.0000	0.0092	0.8589	0.0093	0.0097
IR	0.43852	-0.29869	1.00000	0.33861	0.11636	-0.06842
	0.0001	0.0092	0.0000	0.0030	0.3235	0.5597
MON	0.23829	-0.02088	0.33861	1.00000	0.25562	-0.14882
	0.0395	0.8589	0.0030	0.0000	0.0279	0.2026
GOV	0.24052	-0.30053	0.11636	0.25562	1.00000	-0.26285
	0.0390	0.0093	0.3235	0.0279	0.0000	0.0237
DINF	0.15397	0.29690	-0.06842	-0.14882	-0.26285	1.00000
	0.1872	0.0097	0.5597	0.2026	0.0237	0.0000

The first statistic in each pair is the Spearman rank correlation coefficient. The second is the probability that the absolute value of the observed correlation will occur for null hypothesis of zero correlation. There are 75 observations for each correlation with the exception of GOV; those have 74 observations.

near-zero correlation with financial deepening, but is positively related to inflationary performance.

The investment ratio performance rankings are negatively correlated with the current account rankings -- the trade-off mentioned in the preceding section -- and correlated significantly and positively with output growth. Inflation is in orthodox theory seen as a spur to physical investment; in this sample of countries, even after adjusting for external conditions, there is some indication that the opposite occurs. The positive linkage between financial deepening and the investment ratio is both significant and large.

Domestic inflation in this sample is significantly and positively correlated with success on the current account, and negatively correlated with current government expenditures.

These correlations provide additional advice on assignment of policy to performance; the relevant Spearman correlations are provided in Table 7. There is a clear preference in the data for financial deepening and for reduced current government expenditure in achieving faster economic growth. Financial deepening is positively correlated with investment success and correlated as well (though not significantly) with reduced inflation. Reduced government current expenditure works to reduce inflation and current account deficits as well. It is surprisingly the case that real adjusted depreciation plays no role in the policy mix: there are only insignificant correlations between real exchange rate regime and performance ranking.

To further investigate the importance of external policy in structural adjustment I consider the correlation of adjusted performance measures with an index of the openness of their trade regime (TRAREG) as assessed by the

Table 7

Spearman Correlations: the Policy Mix

	YGR	CAR	IR	DINF
GOV	-0.24052	-0.30053	0.11636	-0.26285
	0.0390	0.0093	0.3235	0.0237
MON	0.23829	-0.02088	0.33861	-0.14882
	0.0395	0.8589	0.0030	0.2026
RERA	-0.09952	0.08951	0.02212	0.23999
	0.4303	0.4783	0.8612	0.0542

The first statistic in each pair is the Spearman rank correlation coefficient. The second is the probability that the absolute value of the observed correlation will occur for null hypothesis of zero correlation. There are 75 observations for each correlation with the exception of GOV (74 observations) and RERA (66 observations).

World Bank in its World Development Report 1987, p. 83. In the World Bank rankings, countries were classified in one of four categories: strongly outward oriented, moderately outward oriented, moderately inward oriented and strongly inward oriented. This ranking, with strongly outward oriented the top rank, was used in the Spearman correlations of Table 8.

The World Bank ranking by trade regime presumably took into consideration the real exchange rate policy of each country; there should thus be a negative correlation between trade regime and adjusted real exchange rate ranking. This correlation exists, but is rather small. Rankings by trade orientation are positively correlated with rankings by economic growth, reduced domestic inflation and current account success. The policies of financial deepening, low government expenditure ratio and outward trade orientation are significantly combined in countries experiencing above-average economic results on external and internal balance.

Contingency tables and correlation analysis provide no testing of causal relationships. In the present analysis, it is impossible to choose from among those positive policy influences to identify which (if not all) caused the relative success in structural adjustment. These results do establish, however, some stylized facts about the structural adjustment process that will be useful in future theoretical research and policy planning in this area.

These conclusions are based upon a complicated statistical technique. It is useful to compare the results with those of unadjusted (i.e., historical) rankings in terms of performance and policy. Spearman correlations based on such rankings are presented in Table 9.

Table 8

Spearman Correlations using the Trade Regime Index

	YGR	CAR	IR	DINF	RERA	MON	GOV
TRAREG	0.748	0.010	0.352	0.095	-0.315	0.331	-0.247
	0.00	0.95	0.03	0.57	0.06	0.04	0.14

Table 9

Spearman Correlations: Unadjusted Performance and Policy Rankings
(75-country sample)

	HYGR	HCAR	HIR	HDINF
HYGR	1.00000	0.05587	0.40828	-0.39024
	0.0000	0.6340	0.0003	0.0005
HCAR	0.05587	1.00000	0.08817	0.12728
	0.6340	0.0000	0.4519	0.2765
HIR	0.40828	0.08817	1.00000	-0.27957
	0.0003	0.4519	0.0000	0.0151
HMON	0.22421	0.02191	0.54996	-0.17642
	0.0531	0.8520	0.0001	0.1300
HGOV	-0.10735	-0.27390	0.29676	-0.26264
	0.3626	0.0182	0.0102	0.0238
HDINF	-0.39024	0.12728	-0.27957	1.00000
	0.0005	0.2765	0.0151	0.0000
HRERA	-0.35280	-0.01651	-0.31957	0.28790
	0.0037	0.8953	0.0089	0.0150

	HYGR	HCAR	HIR	HDINF	HRERA	HMON	HGOV
RANKTRA	0.559	0.074	0.458	-0.129	-0.454	0.415	0.045
	0.00	0.66	0.00	0.44	0.00	0.01	0.78

These results are quite comparable to those using adjusted performance measures as reported in Tables 6 through 8. Here as well is evidence of the importance of financial deepening to internal and intertemporal balance, and of lower government current expenditure to external balance. There are a number of important differences as well. The historical (unadjusted) measures indicate a significant impact of real devaluation on economic growth and the investment ratio; these correlations lose their significance in the adjusted measure. The historical measures as well indicate a growth-inflation tradeoff as well as an investment-inflation tradeoff that are insignificant in the adjusted measures. In addition, analysis using the adjusted measures suggests that reduced government current expenditure is significantly associated with increased economic growth: that correlation is there, but insignificantly so, in the historical analysis. The final section of Table 9 demonstrates the power of the index of trade regime in historical data as well.

IV. Conclusions.

Structural adjustment policies can be evaluated in an atheoretical manner by examination of observed economic performance. However, doing so requires both correction of historical performance for the hospitality of the external environment and definition of a benchmark against which individual country performances can be compared. The body of this paper presents the econometric methodology and estimation results that make that correction and definition.

Measures of structural performance measures are altered significantly by the adjustment for the hospitality of the external environment. Rankings

of countries based upon observed economic growth, current account or investment ratio performance are quite different from those that control appropriately for events beyond the country's control. Analysis of these adjusted rankings provides systematic evidence for three of the anecdotal conclusions of the structural-adjustment debate. First, there is an important negative linkage between current account improvement and reductions in investment ratios. Second, an outward trade orientation is strongly correlated with success in achieving both internal and external balance. Third, there is a presumption in favor of deep financial markets and lower current government expenditure for more successful structural adjustment.

The results raise some puzzles as well. Real exchange rate depreciation is not so strongly correlated with successful structural adjustment as is supposed in most of the literature (and as is true in the unadjusted data). There does not seem to be a trade-off across countries between high economic growth and current-account deficits: those countries successful at one are more often successful at the other on average.

This research can be carried in two directions from this point. First, these issues can be examined for a larger number of policy and performance measures, and for more countries -- conceivably the analysis can be undertaken for the entire population of developing countries. This increased coverage would improve the precision of the lessons to be learned. Second, the rankings and correlations that emerge from section III can be used as "stylized facts" to inform a new generation of theorizing about the process of structural adjustment. Rather than beginning from theoretical

first principles, we can begin from the observed behavioral patterns to assemble a more complete theory of this adjustment process.

Bibliography

Berg, E. and A. Batchelder (1985): "Structural Adjustment Lending: A Critical View", CPD Discussion Paper 1985-21, January.

Bacha, E. and R. Feinberg: "The World Bank and Structural Adjustment in Latin America," World Development 14, March 1985, pp. 333-346.

Celâsun, M. and D. Rodrik: "Debt, Adjustment and Growth: Turkey", in Sachs, J. and S. Collins, eds.: Developing Country Debt and Economic Performance, vol. 3. Chicago, IL: University of Chicago/NBER, 1989.

Chenery, H., and M. Syrquin: Patterns of Development 1950-1970. London: Oxford University Press, 1974.

Cline, W. and S. Weintraub, eds.: Economic Stabilization in Developing Countries. Washington, DC: Brookings Institution, 1983.

Conway, P.: Economic Shocks and Structural Adjustments: Turkey After 1973. Amsterdam: North Holland, 1987.

----------: "Quantifying Developing-Country Success in Structural Adjustment: An Atheoretic Approach", processed, 1990.

De[illegible], M.: Probability and Statistics. Reading, MA: Addison Wesley, 1975.

Devarajan, S. and J. de Melo: "Evaluating Participation in African Monetary Unions: A Statistical Analysis of the CFA Zones," World Development, vol. 15, 1987, pp. 483-496.

Edwards, S.: The Order of Liberalization of the External Sector in Developing Countries. Princeton, NJ: Essays in International Finance 156, 1984.

----------: Real Exchange Rates, Devaluation and Adjustment. Cambridge, MA: MIT Press, 1989.

Fry, M.: Money, Interest and Banking in Economic Development. Baltimore, MD: Johns Hopkins University Press, 1988.

Griliches, Z.: "Estimating the Returns to Schooling: Some Econometric Problems," Econometrica 45, 1977, pp. 1-21.

---------- and J. Hausman: "Errors in Variables in Panel Data", Journal of Econometrics 31, 1986, pp. 93-118.

Guitian, M.: "The Fund's Role in Adjustment," Finance and Development, 1987.

Hausman, J. and W. Taylor: "Panel Data and Unobservable Individual Effects," Econometrica 49, 1981, pp. 1377-1398.

Judge, G., W. Griffiths, R. Hill, and T. Lee: The Theory and Practice of Econometrics. New York: Wiley and Sons, 1980.

Kmenta, J.: Elements of Econometrics. New York: MacMillan, 1971.

Maddala, G.: "Limited Dependent Variable Models Using Panel Data," Journal of Human Resources XXII, 1987, pp. 307-338.

McKinnon, R.: Money and Capital in Economic Development. Washington, DC: Brookings Institution, 1973.

Mosley, P. 1987. Conditionality as Bargaining Process. Princeton, NJ: Essays in International Finance 168.

Nicholas, P.: "The World Bank's Lending for Adjustment," World Bank Discussion Paper 34, 1988.

Reisen, H.: "Disequilibrium Prices and External Debt: An Empirical Analysis for 1978-1984", in C. Bradford, ed.: Europe and Latin America in the World Economy. New Haven, CN: Yale Universi , 1985.

Rodrik, D. 1987. "Trade and Capital-Account Liberalization in a Keynesian Economy," Journal of International Economics.

Sachs, J.: "Conditionality and the Debt Crisis: Some Thoughts for the World Bank", processed, 1986.

Sachs, J.: "Efficient Debt Reduction", conference paper for World Bank symposium on Dealing with the Debt Crisis, 1989a.

---------: New Approaches to the Latin American Debt Crisis. Princeton, NJ: Essays in International Finance 174, 1989b.

Salter, W.: "Internal and External Balance: the Role of Price and Expenditure Effects", Economic Record, 1959, pp. 226-238.

Schloss, M. and V. Thomas: "Adjustment with Growth: Colombia's Experience," Finance and Development, 1986.

Selowsky, M.: "Adjustment in the 1980s: An Overview of Issues," Finance and Development, 1987.

Shaw, E.: Financial Deepening in Economic Development. New York: Oxford University Press, 1973.

Swan, T.: "Longer-run Problems of the Balance of Payments", in Arndt, H. and W. Corden, eds.: The Australian Economy. Melbourne: Cheshire Press, 1963.

Tanzi, V. "Fiscal Policy, Growth and Stabilization Programs," Finance and Development, 1987.

Williamson, J., ed.: IMF Conditionality. Cambridge, MA: MIT Press, 1983.

World Bank: World Tables 1987.

----------: World Debt Tables 1989-90.

----------: World Development Report. New York: Oxford University Press, various years.

----------: "Report on Adjustment Lending," Country Economics Department, 1988.

----------: "Report on Adjustment Lending II", Country Economics Department, 1990.

Yagci, F., S. Kamin, and V. Rosenbaum: "Structural Adjustment Lending: An Evaluation of Program Design," World Bank Staff Working Paper 735, 1985.

Endnotes

1. Much of this effort at definition has come from the World Bank and its critics. The World Bank's commitment to structural adjustment lending beginning in 1980 has encouraged a wide theoretical discussion of the meaning and implementation of structural adjustment by its staff: see for example Yagci, Kamin and Rosenbaum (1985), Selowsky (1987) and Nicholas (1988). Staff at the International Monetary Fund has also actively discussed these issues: Guitian (1987) and Tanzi (1987). Outside commentators have included Berg and Batchelder (1985), Bacha and Feinberg (1986), Sachs (1986) and Mosley (1987).

2. Edwards (1984) and Rodrik (1987) discuss the importance of sequencing of stabilization and structural adjustment policies.

3. An important example of this type of analysis is the pair of adjustment lending reports done within the Research Department of the World Bank; World Bank (1988) and World Bank (1990). The second addresses the concerns of this paper in the context of evaluation of Structural Adjustment Lending programs.

4. Endogenous government policy is introduced in a later part of this section.

5. Maddala (1987) provides an introduction to this technique. Judge, et al. (1980) refer to this specification as the dummy variable model, as opposed to the error-components or random-effects model in which a_i is a random variable with distribution parameters to be estimated. The fixed-effect specification is attractive in that it does not introduce the omitted-variables biases of random effects approaches. Given that our statistical specification will of necessity not include all important determinants of economic performance, the possibility of bias would be quite strong in a random-effects model. Hausman and Taylor (1981) discuss the implications of this bias for a "human capital" specification of wage determination; Griliches (1977) provides a prior treatment. Devarajan and de Melo (1987) is an application of these techniques.

6. If the right-hand side variables are observed with error then the fixed-effects methodology will exacerbate an "errors in variables" bias in the regression. Griliches and Hausman (1986) illustrate this problem and propose appropriate instrumental variables. In Conway (1990) I compare the regression results obtained using observed values with those generated by random-effects estimation; that comparison provides no indication that the present methodology is inappropriate.

7. Without theoretical restrictions on the parameters or covariance matrix, the values of normal government response g cannot be identified.

8. Use of the current-account ratio provides a comparable index of performance across countries. Similar difficulties arise in deriving comparable indices of the terms of trade across countries. In the empirical

section of this study I use a normalization of the terms of trade and real exchange rate indices to ensure this comparability. These difficulties are addressed in the empirical section and in Conway (1990).

9. Real growth in exports is not considered as an independent external determinant of performance. In the methodology of this paper this growth is due either to a growth in real demand in the rest of the world that will be a shared characteristic of developing countries or to endogenous choices made to improve the relative attractiveness of that country's goods. These latter belong in the "fixed effect" term, while the former is picked up where relevant by year-specific dummy variables as discussed below.

10. Inclusion of external debt as a constraint on economic performance raises important conceptual issues. The debt was after all incurred as a conscious (or unconscious) economic policy. I include only previously incurred external debt as a component of the external environment. From a logical standpoint, whatever the motivations for initially incurring the debt the developing country must now plan its policy taking that accumulation as a given. From a statistical standpoint this ensures previously incurred debt will be exogenous to the performance measure considered.

I do consider the decision to incur new debt through examination of the current account ratio, since a decision to have a deficit is a decision as well to accept more debt. To that extent new debt is an endogenous variable.

11. It would be preferable to consider explicitly the real domestic interest rate for these countries. However, such data are not always available. As McKinnon (1973) and more recently Fry (1988) have noted, adjustments in real interest rates would be attractive for the increase in financial intermediation they engender; this effect should be captured by the use of a measure of financial deepening.

12. The long-term/short-term distinction is made as in World Bank (1987). Long-term refers to debt with original maturity of one year or more.

13. There is also a strong common element to movements in the terms of trade, the real interest rate and real debt variables across countries. Introduction of the year-specific dummy variables will thus lower the significance of TOT and RR variables in least-squares regression but will not bias the estimation of fixed-effect terms. Conway (1990, Annex E) provides further detail.

14. For each equation, an intercept was specified such that the regression equation when evaluated at the panel means of independent variables equaled the mean of the dependent variable. The dependent variable was then transformed by subtraction of this intercept. The resulting fixed-effect coefficients are distributed around zero, with zero indicative of "normal" performance.

Table 1 does not report the country-specific fixed effects. These are available in the data appendix to this paper.

15. These anomalous results may be due as well to the inclusion of the year-specific dummy variables. As real interest rates and debt burdens have a strong commonality of movement over time among developing countries, those negative effects may have been captured in the coefficients on those dummy variables. Those effects will also be evident in the IR equation.

16. Use of quasimoney alone as an alternative measure of financial deepening yields essentially identical results.

17. The results for another normalization of the real exchange rate (RERB) are qualitatively the same, and are available from the author on request.

18. The number of α_1 significantly different from zero per equation is:
YGR 22, CAR 17, IR 36, MON 48, GOV 46, RERA 12.
Because they are not necessarily symmetrically distributed around zero nor available for the same countries, some cells of the contingency tables have expected value less than five.

Appendix: An Atheoretic Evaluation

A more complete statement of the details of data collection and estimation methodology is available in Conway (1990).

I. Data sources for the variables used in this study.

The data set includes the following variables for 75 countries.[1] Although the data have a time horizon of 1974-1989, in practice missing observations led to a restriction for estimation purposes to the period 1976-1986.

Some of the variables are available for only a subset of countries:

TRAREG is available for 38 of the countries.
RERA and RERB are available for 67 of the countries.

Listings of the countries in each subset are available on request or could be inferred from the original sources.

YGR: Economic growth is measured by percentage change in real GDP at factor cost (except for Bolivia, for which real GNP is used).

IR: Data on real domestic investment are drawn from the World Tables and are scaled by real GNP to provide a ratio insensitive to country size.

CAR: Data on the current account balance denominated in US dollars are drawn from the World Tables and multiplied by the average exchange rate with the US dollar, also from that source. This product is divided by nominal GNP to provide a country-insensitive scaling.

RR: The international interest rate is defined by subtracting the US CPI inflation rate from the average nominal rate on all borrowing by that country taken from the World Debt Tables. It is thus an ex post measure of the real interest rate.

LTDPC, STDPC: International debt is total debt, including private, public and publicly guaranteed, deflated by the US CPI to billions of 1980 US dollars.

---

[1] The countries are Algeria, Argentina, Bangladesh, Barbados, Benin, Bolivia, Botswana, Brazil, Burkina Faso, Burundi, Cameroon, Central African Republic, Chile, Congo, Colombia, Côte d'Ivoire, Costa Rica, Cyprus, Dominica, Ecuador, Egypt, El Salvador, Ethiopia, Fiji, Gabon, Gambia, Ghana, Greece, Guyana, Honduras, India, Indonesia, Jamaica, Jordan, Kenya, South Korea, Liberia, Lesotho, Madagascar, Malaysia, Malawi, Mali, Mauritania, Mauritius, Mexico, Morocco, Nicaragua, Niger, Nigeria, Pakistan, Panama, Peru, Philippines, Portugal, Paraguay, Rwanda, Senegal, Sierra Leone, Singapore, Sri Lanka, Sudan, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Uruguay, Venezuela, Yemen, Yugoslavia, Zaire and Zambia.

It is stated in per capita form for each country.[2] It is subdivided into a longer-term component and a short-term component.[3] The debt is lagged in estimation: i.e., the debt of period t is defined as the debt existing at the end of period t-1.

TOT: The terms of trade statistics are drawn from the World Tables, and are rescaled as discussed below. An upward movement is an improvement in the terms of trade.

RER: The real exchange rate data are drawn from a sample of multilateral exchange rate series constructed by the CECTP Division of the World Bank. These are available for a 19-country subset of the data: Botswana and Singapore are excluded. It is normalized as discussed in the following section. A depreciation is an downward movement in the ratio.

YASHR: The share of total output coming from the agricultural sector is used as a proxy for the secular stage of economic development.

TRAREG: The trade regime is as assessed by the World Bank in its World Development Report 1987, p. 83. Seventeen of the countries in the sample were classified in one of four categories: strongly outward oriented, moderately outward oriented, moderately inward oriented and strongly inward oriented. These were given the ranks 4 through 1 for purposes of analysis in this study. Excluded countries were Algeria, Botswana, Egypt and Morocco.

DINF: Domestic inflation is calculated as the percentage change in the domestic CPI. For period t, it is the percentage change from t-1 to the present.

USINF: The percentage change in the United States CPI. It is calculated analogously to DINF.

MON: The ratio of "money, broadly defined" to GNP in nominal terms drawn from the World Tables.

GOV: The ratio of government current expenditure to GNP in nominal terms drawn from the World Tables.

---

[2] The data are presented in per capita form to provide a country-insensitive scaling. Initially I used a scaling in terms of GNP similar to that for the current account, but the valuation effects of nominal depreciation differing from domestic inflation led to extreme swings in the variable for some Latin American countries. I judged that these swings unrealistically magnified the varying effect of external debt on performance, and chose the alternative specification.

[3] The long-term/short-term distinction is made as in World Bank (1987). Long-term refers to debt with original maturity of one year or more.

II. Transforming the terms-of-trade and real exchange rate data for cross-country comparisons.

A. The data on the TOT from the World Tables are normalized for each country at the common year: TOT for all countries equals 100 in 1980. When making cross-country comparisons this can be misleading, for the TOT in 1980 may have been more favorable to one country than to another. This will introduce a bias into estimates of fixed-effect coefficients.

I deal with this by forming standardized versions of TOT. I follow three steps:

(a) calculate the mean and standard deviation of TOT for each country in the data base over the period 1967-1986.

(b) calculate a normalized TOT series called TOTA by subtracting the mean derived in (a) from each value of TOT.

(c) calculate a normalized TOT series called TOTB by subtracting the mean and then dividing by the standard deviation for each value of TOT. This becomes a standard normal approximation to the TOT that can be compared across countries.

B. The real exchange rate data from CECTP of the World Bank are scaled similarly to the terms of trade: for each country, the real exchange rate is equal to 100 in 1980. For identical reasons a cross-country comparison should normalize this variable.

I define two new variables: RERA and RERB. These are defined analogously to TOTA and TOTB, using the means and standard deviations computed over the period 1965-1988. The means and standard deviations are given for the countries in the 21-country data set in the table below. Note that CECTP does not report real exchange rates for two of those countries -- Botswana and Singapore.

The two forms of TOT, as well as the two forms of RER, are closely related but not identical. One (TOTA and RERA) is a linear transform of the non-normalized variable for each country, while the other is a non-linear (logarithmic) transform. There is no a priori rule to use in choosing between the two forms. If the world is "linear in logarithms", then the B transforms are more appropriate; if the world is "linear in levels", then the A transforms are more appropriate.

Furthermore, TOT and RER are not identical. TOT is the relative price of traded goods in the world market; RER is the nominal exchange rate adjusted for the ratio of consumer price indices at home and abroad. Movements in non-traded goods prices will perturb RER but not TOT (directly) in the time period considered in this study.

There is very little difference between TOTA and TOTB, and regression results reflect this: the two have nearly interchangeable effects as regressors in the equations reported in this study. TOTB has slightly (but consistently) greater explanatory power as measured by the R^2, and regressions using this measure will be the basis of interpretation in this study. RERA and RERB are less identical; results using RERA were chosen to be reported in the text, but those using RERB are available on request. TOTA and RERA are positively correlated, although not perfectly so. There will thus be scope for uncovering

differences in RER policy choices as is done in this study.

The large data set exhibits even less correlation between the TOT and RER time series. A correlation calculated for a subset of 66 countries yielded the following correlation matrix.

III. Commonality in Movements of Regressors Across Time

The common regressors, especially TOTB and RR, often make insignificant contributions to the fixed-effect equations in CAR, IR, MOR and MON. This is due in part to the simultaneous inclusion of these regressors and the year-specific dummy variables in the equations. These variables moved in concert for the included countries over this time period. There is a great deal of comovement across countries in TOTB and RR, especially prior to 1982. In the IR and CAR regressions reported in the text the coefficients of TOTB and RR are insignificantly different from zero. This insignificance can be explained by the presence of the year-specific dummy variables. Conway (1990) has a more detailed discussion of this.

IV. Correcting for non-random error structures.

The theoretical discussion of section II in the text highlighted the possibility of serial correlation within the panel data set. Given the cross-country nature of the data, it is reasonable to expect elements of heteroskedasticity as well. Parameter estimates under OLS will be consistent despite these irregularities, but hypothesis testing based upon standard errors of OLS estimates will be biased. There are trade-offs involved in employing more efficient statistical estimators. In this section I outline these trade-offs both in theory and in simulation; I also test the the errors of regression analysis for heteroskedasticity and autoregressive error structures.

A. Theoretical exposition.

I begin with the hypothesis that changes in the external environment will have systematic, or "normal", effects on the performance of individual countries. There will be idiosyncracy as well in country-specific response. The regression equation that reflects the most general form of this hypothesis is

$$y_{it} = \alpha_o + \alpha_i + X_{it}\,\beta + \alpha_t + \epsilon_{it}.$$

For country i in period t, $X_{it}\,\beta + \alpha_t$ represents the systematic influence of the external environment on the measure of performance y_{it}. α_o is the idiosyncratic under- or over-performance of the numeraire country relative to that norm, and α_i measures to what extent country i has more positive performance that the numeraire country. These can easily be transformed as in the text to allow country-specific deviation around the sample norm. ϵ_{it} is the time-varying component of idiosyncratic country-i performance.

There is no a priori reason to expect ϵ_{it} to be identically and independently distributed. I therefore consider its general form to be

$$\epsilon_{it} = \rho_i\,\epsilon_{it-1} + u_{it}\ , \qquad u_{it} \sim N(0,(1/\omega_i)\sigma^2)$$

This allows both for the random error of each country to have a different variance and for a country-specific autoregressive error structure.

Since external shocks are controlled for in the estimation procedure, the ω_i and ρ_i can be thought of as country-specific characteristics just as the fixed-effect terms can. ω_i indicates the variability of observed performance relative to the "normal" level σ^2, and could be due to stop-go policy-making or perhaps to decisions to eschew use of government policy for stabilization (in the spirit of economic liberalization, for example).[4]

ρ_i will indicate the persistence of deviations from "normal" levels. Country i may through policy innovation achieve improved performance relative to the norm, but may through subsequent inaction slowly revert toward normal levels. If this complete scenario occurred within the sample period the fixed-effect measure for country i would be positive while ρ_i would also be positive. Avoiding this reversion will be a positive feature in performance of above-norm countries.[5]

The GLS methodology employed here is designed to ensure that equation errors are drawn from a constant-variance random normal sample. Sample estimates of ω_i and ρ_i are calculated through an initial OLS regression; these are denoted $\hat{\omega}_i$ and $\hat{\rho}_i$. These are used in the following transformation of variables to ensure that the classical properties of errors are met.

$$\hat{\omega}_i(y_{it} - \hat{\rho}_i y_{it-1}) = \hat{\omega}_i[\alpha_o + \alpha_i + (X_{it} - \hat{\rho}_i X_{it-1})\beta + \alpha_t] + v_{it}.$$

The v_{it} have the desired asymptotic properties. Conway (1990) examines the regression residuals for the panel results reported above; in the large majority of cases the null hypothesis of normality cannot be rejected.

B. Evidence from estimation.

Heteroskedasticity is a pronounced problem in this data set. The existence of heteroskedasticity does not introduce bias into the estimated coefficients of the regressions; they remain unbiased and consistent. However, the estimate of the variance-covariance matrix is biased, thus leading to possible erroneous conclusions in hypothesis testing. Kmenta (1971, p. 268) presents a test for homoskedasticity attributed to Hoel (1955). The statistic calculated for this sample of countries tests the existence of significant differences across countries in residual variance, and is distributed approximately as a $\chi^2(20)$

---

[4] In the finance jargon, a country policy that would generate this increased variability would be called a "high-beta" policy.

[5] It will not be enough to examine the value of ρ_i. There are many circumstances in which large and positive ρ_i could be considered favorable to performance: one example would be an under-performing country that slowly raises its performance towards the norm.

distribution.[6] These statistics as reported in Table A1 indicate that the null hypothesis of homoskedasticity must be rejected for all performance measures.

The undesirable properties of heteroskedasticity are removed from regression residuals through an appropriate GLS rescaling of dependent and explanatory variables. The reciprocals of country-specific variances serve as weights in an iterative GLS procedure to generate consistent hypothesis tests of regression coefficient estimates.

Table A1

TESTS FOR HOMOSKEDASTICITY
(H_o: the sample does not exhibit significant variation in country variances)

Critical $\chi^2(20) = 31.41$ (95 percent level of confidence)

	YGR	CAR	IR
Correction for serial correlation	97.82	83.23	118.55
No correction	95.58	136.19	126.49

B. Country-specific autoregressive errors.

In a panel data set it is likely that each economy will have a different degree of autoregression of errors, and when the autoregression is pronounced it will bias the estimates of the standard errors of coefficients. This autoregression could be due to sluggishness in adjustment to changes in policy or external stimuli.

The GLS regression technique used in this paper generates estimates of these autoregressive coefficients to correct the variance-covariance matrix. Since it is a sample estimate there is no presumption that the statistic must lie between -1 and 1, but realizations outside that range are rare.

Realizations of the autoregression coefficient close to unity lead to a large upward bias in the standard errors of coefficients, as discussed earlier.

---

[6] The hypothesis test results reported here do not correspond exactly to the statistic reported in Kmenta (1971). He uses a variance of the dependent variable from the sample mean to test for homoskedasticity, while I have used the variance calculated from the predicted value based on the OLS regression. Given the heteroskedasticity in terms-of-trade movements documented in this section, this adaptation appeared a more rigorous test of residual heteroskedasticity.

REGRESSION RESULTS: FIXED-EFFECT EQUATIONS

DEP VARIABLE: YGR

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	80	458.73221	5.73415268	7.122	0.0001
ERROR	660	531.35277	0.80507996		
U TOTAL	740	990.08499			

ROOT MSE	0.8972625	R-SQUARE	0.4633
DEP MEAN	-0.254204	ADJ R-SQ	0.3983
C.V.	-352.97		

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		0.03738737	0.03892578	0.960
TOTB		0.88153955	0.16148156	4.857
RR		-0.18022396	0.03384229	-5.325
LTDPC		-2.40206449	1.40263528	-1.713
STDPC		-8.01496529	2.22936896	-3.595
DARG		0.95522805	1.89362956	0.504
DBDI		-3.14349120	2.35666762	-1.334
DBEN		-1.23310028	2.00453817	-0.615
DBGD		-2.44389563	2.02138497	-1.209
DBOL		-6.42721891	2.54918121	-2.521
DBRA		2.92919089	1.92284050	1.523
DBRB		2.18900881	2.51417335	0.871
DBWA		7.73848038	1.87632848	4.124
DCAF		-5.49256748	2.34960236	-2.338
DCHL		3.30943999	3.24223139	1.021
DCIV		0.79042844	2.40045724	0.329
DCMR		6.27767633	1.84242309	3.407
DCOG		4.28576583	7.13365553	0.601
DCOL		-0.20364516	1.10542335	-0.184
DCRI		2.64993780	3.27717866	0.809
DCYP		6.78766617	2.11252265	3.213
DDOM		-0.69053496	1.34126813	-0.515
DDZA		2.63980850	1.32094890	1.998
DECU		1.54202888	1.25681341	1.227
DEGY		2.62794468	1.72526291	1.523
DETH		-4.06035886	2.13645217	-1.901
DFJI		-0.01067581	1.62515980	-0.007
DGAB		-1.01159130	3.91902375	-0.258
DGHA		-4.58356140	3.05497243	-1.500
DGMB		-3.60559022	2.30096752	-1.567
DGRC		2.47074232	1.32193700	1.869
DGUY		-4.57706455	2.18395135	-2.096

DHND	0.15965895	2.10558228	0.076
DHVO	-1.80064274	1.79565122	-1.003
DIDN	-0.27573192	1.42965472	-0.193
DIND	-0.27195341	1.53872372	-0.177
DJAM	-1.58814702	2.52456884	-0.629
DJOR	6.17115032	1.48712108	4.150
DKEN	-0.18080080	1.37204796	-0.132
DKOR	6.99867100	1.96784397	3.557
DLBR	-4.55334592	2.01435208	-2.260
DLKA	0.27784681	1.14939282	0.242
DLSO	2.38610084	2.41254897	0.989
DMAR	0.95521902	1.45156635	0.658
DMDG	-5.43313333	2.12273504	-2.559
DMEX	2.78089373	1.84528253	1.507
DMLI	-3.91422756	2.80494273	-1.395
DMRT	-1.66314256	1.69607580	-0.981
DMUS	1.58655564	2.08354857	0.761
DMWI	-1.89971779	2.33926768	-0.812
DMYS	3.90578449	1.15741458	3.375
DNER	-2.35703344	3.30795924	-0.713
DNGA	-6.31685187	2.43302703	-2.596
DNIC	-3.92261202	3.07513519	-1.276
DPAK	2.07617693	1.24902833	1.662
DPAN	7.11160029	2.87988875	2.469
DPER	0.66000883	2.33751389	0.282
DPHL	-0.59835907	2.73674455	-0.219
DPRT	3.04316034	1.40037584	2.173
DPRY	1.54910507	2.68499973	0.577
DRWA	-0.94339590	2.48911761	-0.379
DSDN	-4.54050558	4.62394229	-0.982
DSEN	-2.21182325	2.00249053	-1.105
DSGP	4.68639732	1.53247524	3.058
DSLE	-2.85950133	1.97721160	-1.446
DSLV	-5.33747854	4.09605719	-1.303
DSYR	-0.91456025	1.39446804	-0.656
DTGO	-2.84025026	2.05186783	-1.384
DTHA	2.21344651	1.04697386	2.114
DTTO	-2.43946337	4.19576685	-0.581
DTUN	1.06421016	1.20634121	0.882
DTUR	1.41356136	2.32926774	0.607
DTZA	-4.92221237	1.81554624	-2.711
DUGA	-9.36217060	5.45414468	-1.717
DURY	0.69251051	2.92419666	0.237
DVEN	3.40607472	1.74583482	1.951
DYEM	0.21998570	2.35916308	0.093
DYUG	1.31030143	2.66466373	0.492
DZAR	-4.53612034	1.61237999	-2.813
DZMB	-2.00662405	1.54991817	-1.295

DEP VARIABLE: DINF

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	81	130.70347	1.61362311	14.253	0.0001
ERROR	660	74.72117880	0.11321391		
U TOTAL	741	205.42465			

ROOT MSE	0.3364727	R-SQUARE	0.6363
DEP MEAN	10.18593	ADJ R-SQ	0.5916
C.V.	3.30331		

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
MUSINF		-0.56072070	0.32454887	-1.728
YASHR		0.75490417	0.33100113	2.281
TOTB		1.01507167	0.90006093	1.128
RR		-0.84530132	0.31077062	-2.720
LTDPC		18.56677767	7.10914434	2.612
STDPC		3.91602752	9.32666430	0.420
DARG		250.10085	26.05483382	9.599
DBDI		-25.64687294	18.90504893	-1.357
DBEN		-17.66629914	19.21746095	-0.919
DBGD		-0.22044255	35.78956466	-0.006
DBOL		1373.21726	380.82325	3.606
DBRA		155.25799	38.55340984	4.027
DBRB		-0.18474890	10.79240457	-0.017
DBWA		461.10063	1666.27440	0.277
DCAF		-14.64356190	15.51913235	-0.944
DCHL		3.08266939	20.40695304	0.151
DCIV		-13.72308610	14.93337304	-0.919
DCMR		-1.78686781	19.28021070	-0.093
DCOG		-5.65424717	13.17204604	-0.429
DCOL		18.98672639	33.51484490	0.567
DCRI		3.00251573	21.39059077	0.140
DCYP		-1.99436565	17.00362623	-0.117
DDOM		6.78174514	7.61862290	0.890
DDZA		0.91730355	7.37402638	0.124
DECU		15.10173661	10.02263723	1.507
DEGY		12.34654683	42.56320577	0.290
DETH		-21.92131190	16.55634183	-1.324
DFJI		-3.24439246	12.32551701	-0.263
DGAB		-16.23295273	22.24251196	-0.730
DGHA		20.59049762	21.30768838	0.966
DGMB		-7.66906379	17.20478662	-0.446
DGRC		6.1097[illegible]88	13.14117019	0.465
DGUY		-9.86877757	17.94378287	-0.550
DHND		-7.81407404	10.19577267	-0.766
DHVO		-10.44794653	15.84722234	-0.659
DIDN		-0.78909004	17.77754849	-0.044

DIND	-3.43210329	26.41435513	-0.130
DJAM	9.96552159	11.63760028	0.856
DJOR	3.24296892	7.51905499	0.431
DKEN	-6.72230389	21.39342354	-0.314
DKOR	-6.99498338	33.85818637	-0.207
DLBR	-19.58438387	32.70787268	-0.599
DLKA	0.58914676	10.47950766	0.056
DLSO	14.29315607	12.09234986	1.182
DMAR	-0.03842251	9.56179244	-0.004
DMDG	-9.16302583	35.06351235	-0.261
DMEX	50.53958524	12.64323645	3.997
DMLI	-28.55099471	21.30510256	-1.340
DMRT	-15.33133193	12.30452672	-1.246
DMUS	7.12776924	11.81470874	0.603
DMWI	-6.94024604	17.72397837	-0.392
DMYS	-10.21890545	18.98163829	-0.538
DNER	-20.16411060	18.40916875	-1.095
DNGA	-6.41888048	49.61659035	-0.129
DNIC	48.97316097	15.45409224	3.169
DPAK	-3.58860492	23.18032285	-0.155
DPAN	-13.32868478	10.75660019	-1.239
DPER	433.32950	471.58052	0.919
DPHL	2.67328941	17.97563386	0.149
DPRT	-240.45698	355.63376	-0.676
DPRY	-159.57383	225.22524	-0.709
DRWA	-22.13752997	16.06798929	-1.378
DSDN	7.43668378	12.86591624	0.578
DSEN	-0.56143810	12.74348449	-0.044
DSGP	3.07827780	6.32007242	0.487
DSLE	13.40245794	30.56929000	0.438
DSLV	5.30172742	20.33243854	0.261
DSYR	-0.24427442	8.61401427	-0.028
DTGO	-14.99710920	16.63734136	-0.901
DTHA	52.07598614	512.62528	0.102
DTTO	8.62463475	12.50786959	0.690
DTUN	0.55107133	16.37602787	0.034
DTUR	49.05411739	38.00652287	1.291
DTZA	-10.98730922	42.85297418	-0.256
DUGA	29.06315020	23.44257097	1.240
DURY	51.86378474	8.08497610	6.415
DVEN	-6.54787453	27.74782751	-0.236
DYEM	0.62440693	13.42984842	0.046
DYUG	37.17820649	8.71668893	4.265
DZAR	32.94741530	22.33948392	1.475
DZMB	15.51736486	8.16972462	1.899

DEP VARIABLE: CAR

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	89	711.36300	7.99284264	12.089	0.0001
ERROR	652	431.07289	0.66115473		
U TOTAL	741	1142.43588			
ROOT MSE		0.8131142	R-SQUARE	0.6227	
DEP MEAN		2.055576	ADJ R-SQ	0.5712	
C.V.		39.55652			

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		0.08228159	0.06170347	1.334
TOTB		1.64559935	0.22562596	7.293
RR		0.06120327	0.07552178	0.810
LTDPC		8.39346120	1.76893247	4.745
STDPC		2.70877335	2.80755627	0.965
DARG		1.46052731	4.44506957	0.329
DBDI		-2.34570217	4.52379125	-0.519
DBEN		-11.18304469	4.61400305	-2.424
DBGD		-3.07577937	3.13889135	-0.980
DBOL		-2.47837173	1.97000883	-1.258
DBRA		3.40236069	1.96615047	1.730
DBRB		-0.39821581	1.96993314	-0.202
DBWA		7.69521778	5.06281157	1.520
DCAF		1.82943193	2.69805398	0.678
DCHL		-5.36193296	3.65905431	-1.465
DCIV		-5.87005346	5.63304081	-1.042
DCMR		12.15314634	7.86896195	1.544
DCOG		-14.58347058	3.58740141	-4.065
DCOL		2.53090742	2.10692330	1.201
DCRI		-10.59879351	2.38690121	-4.440
DCYP		-5.56115113	2.07768709	-2.677
DDOM		1.63579440	1.97951837	0.826
DDZA		0.54163946	4.36426731	0.124
DECU		-1.27623028	1.61071334	-0.792
DEGY		-7.28695450	3.28093036	-2.221
DETH		0.54229365	2.97387915	0.182
DFJI		0.16326937	1.63533039	0.100
DGAB		-4.61072898	4.90859778	-0.939
DGHA		5.36713299	4.39890603	1.220
DGMB		-3.30299040	5.07891227	-0.650
DGRC		-2.27374182	2.68230641	-0.848
DGUY		-22.55199213	4.20279363	-5.366
DHND		-3.29365742	2.07253182	-1.589
DHVO		2.74831934	2.93942958	0.935
DION		3.37739300	3.17305129	1.064
DIND		7.12208277	2.95363337	2.411
DJAM		-6.54540329	2.77972470	-2.355

DJOR	2.58858138	2.98009406	0.869
DKEN	3.57100790	4.73793637	0.754
DKOR	2.18610835	1.84394739	1.186
DLBR	6.88610790	2.80988227	2.451
DLKA	-1.10286489	3.54949325	-0.311
DLSO	10.73090935	2.83606547	3.784
DMAR	-1.20660082	2.88941617	-0.418
DMDG	-4.03859503	2.97811740	-1.356
DMEX	1.70327728	1.73708131	0.981
DMLI	-8.27339842	9.60894900	-0.861
DMRT	-18.05589172	2.88593294	-6.257
DMUS	1.18803703	2.72906354	0.435
DMWI	-4.76074110	5.70303465	-0.835
DMYS	-6.77552250	11.15726160	-0.607
DNER	-0.10235478	3.40171097	-0.030
DNGA	3.27828340	2.70799670	1.211
DNIC	-17.69409512	9.07743033	-1.949
DPAK	10.29827111	5.44846891	1.890
DPAN	-0.28461776	5.72983755	-0.050
DPER	6.27637626	4.32382975	1.452
DPHL	3.47596846	2.04531787	1.699
DPRT	0.17711060	2.62028885	0.068
DPRY	-0.71307807	2.47662481	-0.288
DRWA	-1.26700606	3.20258488	-0.396
DSDN	-2.64905302	2.86448437	-0.925
DSEN	-7.07891967	2.72359340	-2.599
DSGP	-0.35031148	2.44208431	-0.143
DSLE	1.97693554	5.99472403	0.330
DSLV	4.49032378	2.53085218	1.774
DSYR	7.65744417	4.62193917	1.657
DTGO	-3.91902585	5.47618127	-0.716
DTHA	2.95579223	1.89966316	1.556
DTTO	-3.36153361	10.82425791	-0.311
DTUN	-4.05503984	1.83407307	-2.211
DTUR	5.22645023	2.82546667	1.850
DTZA	-4.79617785	3.61304276	-1.327
DUGA	1.70907883	4.42523507	0.386
DURY	2.30621564	1.50852219	1.529
DVEN	-1.44856074	2.76745282	-0.523
DYEM	773.98191	1225.95705	0.631
DYUG	2.89055362	1.47126977	1.965
DZAR	1.58354974	3.07785900	0.514
DZMB	-5.92873971	2.15856579	-2.747
D77	-0.58121502	0.62560050	-0.929
D78	-0.97879621	0.60564921	-1.616
D79	-0.52454638	0.69329357	-0.757
D80	-1.80325215	0.71882591	-2.509
D81	-2.14969366	0.56064071	-3.834
D82	-2.42111720	0.54132512	-4.473
D83	-0.49822194	0.54009840	-0.922
D84	-0.30833219	0.53411091	-0.577
D85	0.09877154	0.53374008	0.185

DEP VARIABLE: IR

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	89	3421.33755	38.44199490	63.470	0.0001
ERROR	647	391.86864	0.60567024		
U TOTAL	736	3813.20619			
ROOT MSE		0.7782482	R-SQUARE	0.8972	
DEP MEAN		-5.25074	ADJ R-SQ	0.8831	
C.V.		-14.8217			

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		-0.22516457	0.04777097	-4.713
TOTB		0.38497867	0.18146286	2.122
RR		-0.10250014	0.06010396	-1.705
LTDPC		-8.47587710	1.56375231	-5.419
STDPC		-3.59868941	2.33422243	-1.542
DARG		-13.62085537	7.16589070	-1.901
DBDI		-2.69268627	3.49166612	-0.771
DBEN		-1.88594135	2.37528004	-0.794
DBGD		-9.14634912	3.64378649	-2.510
DBOL		46.49823364	36.53332429	1.273
DBRA		-3.24000440	1.68530937	-1.922
DBRB		-2.28621024	1.39552423	-1.638
DBWA		8.10245983	5.33825906	1.518
DCAF		-11.69240981	4.76260502	-2.455
DCHL		-4.73457285	2.11263934	-2.241
DCIV		-2.55314815	7.55069172	-0.338
DCMR		1.87949496	1.67583402	1.122
DCOG		15.80015260	7.76599784	2.035
DCOL		-6.94691135	2.41481104	-2.877
DCRI		9.68110479	4.80576559	2.014
DCYP		12.01127216	1.97099447	6.094
DDOM		-0.02973754	1.09888727	-0.027
DDZA		15.38047594	2.67596602	5.748
DECU		1.87493167	1.19112889	1.574
DEGY		6.85179719	1.61550219	4.241
DETH		-13.44266961	3.04997224	-4.407
DFJI		0.15732341	3.21619428	0.049
DGAB		144.98774	61.32993093	2.364
DGHA		-12.09679813	2.79699738	-4.325
DGMB		0.60516196	2.62683355	0.230
DGRC		4.73198531	2.41792454	1.957
DGUY		10.59887838	2.97647423	3.561
DHND		0.16291339	2.17053840	0.075
DHVO		-4.54305067	2.81438748	-1.614
DIDN		2.76538279	2.15240977	1.285
DIND		-1.10600596	2.43410585	-0.454
DJAM		-2.04426008	10.12705761	-0.202

DJOR	10.37532826	3.29370774	3.150
DKEN	2.84065511	1.62612680	1.747
DKOR	9.02429077	2.22624895	4.054
DLBR	-11.60058283	8.64522324	-1.342
DLKA	0.73709037	12.31247718	0.060
DLSO	-12.46709822	1.85620452	-6.716
DMAR	0.52355753	2.26396255	0.231
DMDG	-4.29903201	2.66043910	-1.616
DMEX	2.44225081	1.65251189	1.478
DMLI	4.50845955	2.68499347	1.679
DMRT	13.58848228	3.04679637	4.460
DMUS	-1.77603406	2.29793971	-0.773
DMWI	-0.09021720	3.39539581	-0.027
DMYS	11.87576412	4.57392126	2.596
DNER	-0.86617391	3.97796411	-0.218
DNGA	-8.47581732	4.02288270	-2.107
DNIC	-0.005499704	3.75371542	-0.001
DPAK	-6.83317614	1.45130435	-4.708
DPAN	5.79397408	2.44988298	2.365
DPER	1.62954815	1.78729786	0.912
DPHL	-1.97595821	3.54571786	-0.557
DPRT	2.07456761	10.53551006	0.197
DPRY	-5.41826619	5.66603995	-0.956
DRWA	-5.96875999	2.59106209	-2.304
DSDN	-6.47549916	3.01322032	-2.149
DSEN	-9.28705951	1.88291112	-4.932
DSGP	14.65084317	6.55212272	2.236
DSLE	-12.69950366	3.13039975	-4.057
DSLV	-11.77025607	4.97384522	-2.366
DSYR	-1.03001757	2.58109705	-0.399
DTGO	9.33229726	3.70199678	2.521
DTHA	0.60556913	1.70804353	0.355
DTTO	1.63263424	1.29485188	1.261
DTUN	6.88240582	1.31250012	5.244
DTUR	-2.30472131	2.06277866	-1.117
DTZA	0.18168510	2.52289361	0.072
DUGA	-3.12262489	7.26733313	-0.430
DURY	-9.77911567	1.20513284	-8.115
DVEN	4.48914183	4.62602938	0.970
DYEM	3.49327008	4.48967043	0.778
DYUG	15.07938990	4.64877426	3.244
DZAR	-8.44448668	2.46755425	-3.422
DZNB	-3.95888155	1.32505549	-2.988
D77	1.34470905	0.51132255	2.630
D78	2.04827154	0.48987009	4.181
D79	1.87667962	0.57188107	3.282
D80	2.18876032	0.60052566	3.645
D81	2.31897741	0.45775936	5.066
D82	1.36755496	0.42651477	3.206
D83	-0.23333029	0.42633669	-0.547
D84	-0.06956399	0.43206623	-0.161
D85	-0.50510015	0.42693920	-1.183

DEP VARIABLE: MON

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	89	3862.80129	43.40226174	76.517	0.0001
ERROR	644	365.29009	0.56722064		
U TOTAL	733	4228.09139			

ROOT MSE	0.7531405	R-SQUARE	0.9136
DEP MEAN	0.2759382	ADJ R-SQ	0.9017
C.V.	272.9381		

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		0.04135206	0.04491810	0.921
TOTB		-0.33189643	0.19649813	-1.689
RR		0.32895193	0.06041756	5.445
LTDPC		8.87083769	1.90739702	4.651
STDPC		8.89570356	2.80007516	3.177
DARG		-11.54984957	3.82612154	-3.019
DBDI		-14.60234015	2.74340800	-5.323
DBEN		-7.80054281	3.00343304	-2.597
DBGD		-9.79956205	2.32294872	-4.219
DBOL		-14.67073264	2.94154971	-4.987
DBRA		-6.98801854	1.88578722	-3.706
DBRB		8.49885686	4.49054652	1.893
DBWA		1.98767461	1.70521288	1.166
DCAF		-10.25007710	4.14667305	-2.472
DCHL		-14.66516971	2.91444592	-5.032
DCIV		12.67083726	48.10290593	0.263
DCMR		-11.32442781	2.39351068	-4.731
DCOG		-10.53771335	24.91923094	-0.423
DCOL		-5.20836354	1.31538859	-3.960
DCRI		1.93901801	3.41826809	0.567
DCYP		36.66295054	16.99672295	2.157
DDON		-4.11128058	3.00461058	-1.368
DDZA		48.93890706	7.20486149	6.792
DECU		-11.84973733	6.81382466	-1.739
DEGY		-123.10977	97.78615020	-1.259
DETH		3.77553181	3.18227713	1.186
DFJI		3.10545545	1.90131481	1.633
DGAB		58.90123286	32.26745708	1.825
DGHA		-15.87973931	88.27312902	-0.180
DGMB		-6.64190004	1.69163722	-3.926
DGRC		56.17508795	10.67982287	5.260
DGUY		128.72496	59.03233561	2.181
DHND		-6.95373195	1.56090349	-4.442
DHVO		-5.64304602	4.68581124	-1.204
DIDN		-12.90745899	1.59414107	-8.097
DIND		13.73251823	2.10746151	6.516

DJAM	21.31968905	6.65451336	3.204
DJOR	79.27547389	6.94519201	11.414
DKEN	11.22089671	2.20958131	5.078
DKOR	-0.81823456	1.39847857	-0.585
DLBR	55.52472786	44.06078448	1.260
DLKA	5.51596215	2.39540175	2.303
DLSO	-18.29481100	8.35345880	-2.190
DMAR	15.61846783	1.27223780	12.276
DMDG	-0.88959049	4.44383506	-0.200
DMEX	-5.68791637	11.30429184	-0.503
DMLI	-12.13383857	2.81741139	-4.307
DMRT	-11.28420574	2.35322881	-4.795
DMUS	13.18852246	3.66636081	3.597
DNMI	-6.03166177	2.57910754	-2.339
DNYS	56.85354874	8.63371948	6.585
DNER	-18.26386054	2.57899293	-7.082
DNGA	-3.03214134	1.74896489	-1.734
DNIC	-6.47224673	4.44512133	-1.456
DPAK	11.33363141	2.66783347	4.248
DPAN	-0.56953077	2.60325374	-0.219
DPER	-16.51157189	1.83006950	-9.022
DPHL	-7.72283937	5.40147139	-1.430
DPRT	80.69399923	6.84673926	11.786
DPRY	-9.47898101	6.00594070	-1.578
DRWA	-6.13675486	6.76452507	-0.907
DSDN	2.61201331	2.68327242	0.973
DSEN	-2.40758768	2.86200885	-0.841
DSGP	54.85245773	3.47292874	15.794
DSLE	-7.15445141	1.87004218	-3.826
DSLV	1.58195166	1.84709708	0.856
DSYR	35.91583737	11.18745310	3.210
DTGO	12.09714997	4.29154867	2.819
DTHA	26.57715964	7.96073764	3.339
DTTO	20.58802161	6.76412256	3.044
DTUN	16.21132734	1.64890051	9.832
DTUR	-6.76206827	1.97985607	-3.415
DTZA	4.22151996	6.24476001	0.676
DUGA	-23.62005360	9.37289848	-2.520
DURY	9.79953017	4.12459802	2.376
DVEN	19.29220535	7.76802242	2.484
DYEM	54.16346477	7.26251791	7.458
DYUG	25.73120977	9.39667478	2.738
DZAR	-14.75286343	6.07262337	-2.426
DZMB	2.86858758	2.45445716	1.169
D77	-3.07003670	0.52449055	-5.853
D78	-3.02959770	0.50521256	-5.997
D79	-2.69467600	0.56993727	-4.728
D80	-2.26609311	0.61367860	-3.693
D81	-2.02697986	0.46023259	-4.404
D82	-1.78772755	0.44305333	-4.035
D83	-1.47690386	0.44278893	-3.335
D84	-0.73820653	0.44962482	-1.642
D85	-0.42180263	0.44109086	-0.956

DEP VARIABLE: GCV

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	79	10124.32197	128.15597	232.179	0.0001
ERROR	649	358.22936	0.55197129		
U TOTAL	728	10482.55134			
ROOT MSE		0.7429477	R-SQUARE	0.9658	
DEP MEAN		-3.34565	ADJ R-SQ	0.9617	
C.V.		-22.2064			

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		-0.14964361	0.01641503	-9.116
TOTB		-0.38246407	0.06385118	-5.990
RR		0.05857872	0.01055480	5.550
LTDPC		-0.54454269	0.33753711	-1.613
STDPC		0.92688743	0.66403856	1.396
DARG		-4.76656741	0.74735208	-6.378
DBDI		2.86255507	1.13022363	2.533
DBEN		-2.42465847	0.80478529	-3.013
DBGD		-4.50204025	1.01214683	-4.448
DBOL		-0.23536627	1.49017248	-0.158
DBRA		-7.95119749	0.35299746	-22.525
DBRB		-0.69030867	0.46965583	-1.470
DBWA		10.48278740	1.35773919	7.721
DCAF		-0.14070579	1.30862837	-0.108
DCHL		-3.40750469	0.42952811	-7.933
DCIV		2.64659683	1.17920294	2.244
DCMR		-7.87517057	2.93634511	-2.682
DCOG		2.06024643	2.39610547	0.860
DCOL		-5.25647174	0.48546930	-10.828
DCRI		2.01895671	0.59473077	3.395
DCYP		-3.49813585	0.77501144	-4.514
DDOM		-16.18049882	6.89633966	-2.346
DDZA		-1.78306271	0.82759023	-2.155
DECU		-2.11222109	0.56685304	-3.726
DEGY		6.52611548	1.32472984	4.926
DETH		4.49850011	0.89674728	5.016
DFJI		3.23118194	3.11117793	1.039
DGAB		1.40593255	1.60380994	0.877
DGHA		-1.10199983	2.29962259	-0.479
DGMB		6.35474693	0.92156420	6.896
DGRC		3.12669261	2.99548919	1.044
DGUY		21.43116501	5.92676025	3.616
DHND		0.16134043	0.63975798	0.252
DHVO		3.55252314	0.80146520	4.433
DIDN		-3.09462321	0.71080433	-4.354
DIND		-3.45633623	0.58695855	-5.889

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
DJAM		1.30271516	2.49435583	0.522
DJOR		72.39364327	73.15868151	0.990
DKEN		5.38526018	0.79461550	6.777
DKOR		-7.05834218	1.24538454	-5.668
DLBR		9.91598126	7.73406087	1.282
DLKA		-7.29341171	1.52701527	-4.776
DLSO		-2.70401995	1.73335058	-1.560
DMAR		3.04086305	1.68054891	1.809
DMDG		1.90617445	2.40637282	0.792
DMEX		-7.16075704	0.52747903	-13.575
DMLI		1.97635303	1.12292876	1.760
DMRT		-5.40079407	20.92562800	-0.258
DMUS		-4.24378424	0.88505146	-4.795
DMWI		4.76400582	1.59046052	2.995
DMYS		2.33369656	0.82211379	2.839
DNER		-0.26846014	1.18767757	-0.226
DNGA		-3.65968610	0.59863347	-6.113
DNIC		35.50102916	25.15444252	1.411
DPAK		-3.79548569	0.52921151	-7.172
DPAN		4.50858622	0.53132575	8.486
DPER		-5.72152268	0.57324203	-9.981
DPHL		-3.76466218	4.98725674	-0.755
DPRT		-2.96018373	0.30932764	-9.570
DPRY		-7.83053866	0.59312669	-13.202
DRWA		4.74035288	0.97293513	4.872
DSDN		1.04648958	1.35343192	0.773
DSEN		4.67904525	1.75500407	2.666
DSGP		-7.53126310	0.25941637	-29.032
DSLE		-2.07486328	0.97512753	-2.128
DSLV		-0.98210242	0.56953747	-1.724
DSYR		5.99814967	0.80699450	7.433
DTGO		1.45456413	0.54636485	2.662
DTHA		-3.16063386	0.42963816	-7.357
DTTO		1.86758751	4.56049271	0.410
DTUN		0.21423102	0.40620327	0.527
DTUR		-9.69940014	5.72268136	-1.695
DTZA		0.21798251	1.94602530	0.112
DURY		-4.28029541	0.45090669	-9.493
DVEN		-3.97309765	0.73116449	-5.434
DYEM		8.43320840	9.88237910	0.853
DYUG		-4.38113458	3.39039221	-1.292
DZAR		-5.72536452	1.08229782	-5.290
DZMB		10.22642862	0.56031711	18.251

DEP VARIABLE: RERA

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	80	1272.46379	15.90579734	31.882	0.0001
ERROR	571	284.86838	0.49889384		
U TOTAL	651	1557.33217			

ROOT MSE	0.7063242	R-SQUARE	0.8171
DEP MEAN	13.31795	ADJ R-SQ	0.7915
C.V.	5.30355		

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR HO: PARAMETER=0
YASHR		0.84417969	0.18595047	4.540
TOTB		-1.55364424	0.68921713	-2.254
RR		0.15546939	0.20116511	0.773
LTDPC		-4.40672875	6.23510690	-0.707
STDPC		15.43288045	8.86640697	1.741
DARG		9.73445480	16.06908046	0.606
DBDI		-10.79012959	12.41662234	-0.869
DBEN		-55.08392262	48.76376074	-1.130
DBGD		-25.51728712	9.70685048	-2.629
DBOL		35.09657618	13.31637760	2.636
DBRA		-22.12974248	24.21045525	-0.914
DCAF		-1.79201196	7.49927237	-0.239
DCHL		-28.15144014	6.92322126	-4.066
DCIV		4.66949931	13.37012808	0.349
DCMR		5.96019778	5.87279533	1.015
DCOG		14.28617633	6.76404623	2.112
DCOL		5.90806803	7.53160507	0.784
DCRI		-31.38074723	31.60020178	-0.993
DDOM		15.39763256	6.43513446	2.393
DDZA		36.55983326	12.87434856	2.840
DECU		18.27745386	5.13677626	3.558
DEGY		-1.62976684	28.92632497	-0.056
DETH		1.84796726	15.73948669	0.117
DGHA		46.27300378	43.73938300	1.058
DGRC		-6.94954823	10.28060011	-0.676
DGUY		4.22908725	7.76431867	0.545
DHND		-2.02833615	6.58910039	-0.308
DHVO		-13.04881600	8.79291246	-1.484
DIDN		-26.00553025	24.63437738	-1.056
DIND		-17.81819868	6.23275078	-2.859
DJAM		-25.43250836	33.42078643	-0.761
DJOR		7.60064638	5.74082727	1.324
DKEN		-3.43030098	6.52127813	-0.526
DKOR		-12.33783349	5.40793076	-2.281
DLBR		-17.75243439	11.25736389	-1.577
DMAR		-12.57700730	21.53769099	-0.584

DNDG	-14.88157475	14.41733494	-1.032
DNEX	7.75363432	7.80283105	0.994
DNLI	-46.10304511	24.65211532	-1.870
DNRT	9.28556994	8.21973108	1.130
DNUS	6.11574720	4.55840975	1.342
DNWI	-11.67176058	6.94802997	-1.680
DNYS	-0.98352238	8.15880162	-0.121
DNER	-16.20923668	10.84435619	-1.495
DNGA	39.03724385	7.97421070	4.895
DNIC	20.41170526	25.97208987	0.786
DPAK	-16.36414487	5.43030355	-3.013
DPAN	-0.18360922	8.22537957	-0.022
DPER	-10.79211064	6.03598999	-1.788
DPHL	-6.96941561	7.84914100	-0.888
DPRT	6.85922147	8.29404936	0.827
DPRY	14.50991034	17.93478109	0.809
DRWA	5.36837273	14.84080182	0.362
DSDN	2.84545106	7.44315820	0.382
DSEN	-0.17757550	6.67266281	-0.027
DSLE	7.39680474	30.78694782	0.240
DSLV	19.75779763	36.91741207	0.535
DSYR	9.83872448	26.75910862	0.368
DTGO	-23.08436612	26.27892375	-0.878
DTHA	-2.02425919	7.20017887	-0.281
DTTO	33.58315659	29.35159094	1.144
DTUN	-21.67424293	17.89690239	-1.211
DTUR	-82.60752367	45.12594935	-1.831
DTZA	25.06171592	20.42000908	1.227
DURY	18.51205807	10.98214976	1.686
DVEN	9.88223000	11.75111660	0.841
DYEM	7.83473548	6.29189057	1.245
DYUG	10.53904656	15.73953527	0.670
DZAR	13.66107444	25.44942678	0.537
DZMB	-8.54383608	10.26943280	-0.832
D77	2.31759565	1.91931072	1.208
D78	0.39884455	1.83035502	0.218
D79	1.64830882	2.02174430	0.815
D80	0.71840415	2.06311123	0.348
D81	3.98783550	1.62283638	2.457
D82	4.33874406	1.52296228	2.849
D83	4.00560453	1.51484696	2.644
D84	4.05521792	1.59869307	2.537
D85	4.30641721	1.57945801	2.727

DEP VARIABLE: RERB

ANALYSIS OF VARIANCE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PROB>F
MODEL	80	573.15268	7.16440851	12.917	0.0001
ERROR	571	316.69483	0.55463193		
U TOTAL	651	889.84751			

ROOT MSE	0.7447361	R-SQUARE	0.6441
DEP MEAN	0.3167172	ADJ R-SQ	0.5942
C.V.	235.1423		

NOTE: NO INTERCEPT TERM IS USED. R-SQUARE IS REDEFINED.

VARIABLE	DF	PARAMETER ESTIMATE	STANDARD ERROR	T FOR H0: PARAMETER=0
YASHR		0.03072837	0.009002911	3.413
TOTB		-0.05768118	0.03614601	-1.596
RR		0.01345065	0.01036281	1.298
LTDPC		-0.35791826	0.25930843	-1.380
STDPC		0.77341733	0.49446825	1.564
DARG		0.35337890	0.59802156	0.591
DBDI		0.40645011	2.10540240	0.193
DBEN		-1.36846215	0.89871691	-1.523
DBGD		-1.36126395	0.53304085	-2.554
DBOL		0.85026233	0.34558779	2.460
DBRA		-1.36376602	1.14755663	-1.188
DCAF		0.08197393	0.37137779	0.221
DCHL		0.05369433	0.24561528	0.219
DCIV		0.74774877	0.74654560	1.002
DCMR		0.38008704	0.29137283	1.304
DCOG		0.44140511	0.35934817	1.228
DCOL		0.24302871	0.38261506	0.635
DCRI		-1.37094126	1.17596349	-1.166
DDOM		0.62745656	0.30682489	2.045
DDZA		2.17113126	1.27594341	1.702
DECU		0.90286833	0.23058896	3.915
DEGY		-0.06160227	0.79083116	-0.078
DETH		0.39278622	0.92719742	0.424
DGHA		-0.14803088	0.60295289	-0.246
DGRC		-0.66385315	0.40283343	-1.648
DGUY		0.25077683	0.59599025	0.421
DHND		-0.08393530	0.64680574	-0.130
DHVO		-0.77895775	0.44488040	-1.751
DIDN		-1.56927904	1.32596343	-1.184
DIND		-0.93984498	0.28972390	-3.244
DJAM		-1.08884976	1.42542715	-0.764
DJOR		-0.04713420	0.32362070	-0.146
DKEN		-0.39303922	0.31824715	-1.235
DKOR		-0.52725813	0.25206088	-2.092
DLBR		-0.99895093	0.90751996	-1.101

DLKA	-2.42024157	1.06377845	-2.275
DMAR	-1.04835777	1.38275728	-0.758
DMDG	-0.29431364	0.44021672	-0.669
DMEX	0.11897767	0.36105610	0.330
DMLI	-3.85064974	3.00605074	-1.281
DMRT	0.53623922	0.83867691	0.639
DMUS	-0.70176039	0.49009426	-1.432
DMWI	-0.90999573	0.40233922	-2.262
DMYS	-0.48418462	0.88613584	-0.546
DNER	-0.81665231	1.15781073	-0.705
DNGA	0.93405497	0.34746180	2.688
DNIC	0.41410974	0.53168150	0.779
DPAK	-0.71450211	0.27976274	-2.554
DPAN	-0.36434614	0.42271041	-0.862
DPER	-0.64034107	0.30435198	-2.104
DPHL	-0.32556667	0.28914857	-1.126
DPRT	22.68367033	23.58374271	0.962
DPRY	0.75164161	0.99663250	0.754
DRWA	0.16120410	0.71068724	0.227
DSDN	0.59109764	0.37504220	1.576
DSEN	-0.30113972	0.48735481	-0.618
DSLE	0.06019529	1.65890492	0.036
DSLV	0.63805093	1.38087270	0.462
DSYR	0.20088993	0.43789819	0.459
DTGO	-1.60694984	1.47041227	-1.093
DTHA	-0.74296959	0.77388299	-0.960
DTTO	1.40774063	1.85993196	0.757
DTUN	41.51236500	20.17860816	2.057
DTUR	-1.60094387	0.85800805	-1.866
DTZA	0.29218229	0.77764343	0.376
DURY	0.81823857	0.73639782	1.111
DVEN	0.38282441	0.49314880	0.776
DYEM	0.31711960	0.27652837	1.147
DYUG	0.22343957	1.31971642	0.169
DZAR	0.43485097	0.67675935	0.643
DZMB	-0.21246792	0.35186613	-0.604
D77	0.15017761	0.08792500	1.708
D78	0.06159344	0.08918003	0.691
D79	0.12690975	0.09549913	1.329
D80	0.10187747	0.10063346	1.012
D81	0.22612675	0.07717360	2.930
D82	0.17866692	0.07316156	2.442
D83	0.13754287	0.07273619	1.891
D84	0.15931725	0.07747574	2.056
D85	0.14452676	0.07675321	1.883

PRE Working Paper Series

	Title	Author	Date	Contact for paper
WPS607	Abolishing Green Rates: The Effects on Cereals, Sugar, and Oilseeds in West Germany	Donald F. Larson Simon Glance Brent Borrell Merlinda Ingco Jonathan Coleman	March 1991	D. Gustafson 33714
WPS608	Cross-Country Studies of Growth and Policy: Methodological, Conceptual, and Statistical Problems	Ross Levine David Renelt	March 1991	CECMG 39175
WPS609	A Sensitivity Analysis of Cross-Country Growth Regressions	Ross Levine David Renelt	March 1991	CECMG 39175
WPS610	Can Preshipment Inspection Offset Noncompetitive Pricing of Developing Countries' Imports? The Evidence from Madagascar	Alexander J. Yeats	March 1991	J. Jacobson 33710
WPS611	Tariff-based Commodity Price Stabilization Schemes in Venezuela	Jonathan R. Coleman Donald F. Larson	March 1991	S. Lipscomb 33718
WPS612	Education and Productivity in Developing Countries: An Aggregate Production Function Approach	Lawrence J. Lau Dean T. Jamison Frederic F. Louat	March 1991	WDR Office 31393
WPS613	Price-Wage Dynamics and the Transmission of Inflation in Socialist Economies: Empirical Models for Hungary and Poland	Simon Commander Fabrizio Coricelli	March 1991	O. Del Cid 39050
WPS614	Accountability in Public Services: Exit, Voice, and Capture	Samuel Paul	March 1991	E. Madrona 37496
WPS615	Socialist Economic Growth and Political Investment Cycles	Heng-fu Zou	March 1991	A. Bhalla 37699
WPS616	Optimal Nonlinear Income Taxation for the Alleviation of Poverty	Ravi Kanbur Michael Keen Matti Tuomala	March 1991	J. Sweeney 31021
WPS617	International Poverty Projections	Sudhir Anand Ravi Kanbur	March 1991	J. Sweeney 31021
WPS618	Poverty and Development: The *Human Development Report* and the *World Development Report*, 1990	Ravi Kanbur	March 1991	J. Sweeney 31021
WPS619	Foreign Direct Investment in Sub-Saharan Africa	Laurence Cockcroft Roger C. Riddell	March 1991	S. King-Watson 33730

PRE Working Paper Series

	Title	Author	Date	Contact for paper
WPS620	Have Commercial Banks Ignored History?	Sule Özler	March 1991	S. King-Watson 33730
WPS621	Sensible Debt Buybacks for Highly Indebted Countries	Enrica Detragiache	March 1991	S. King-Watson 33730
WPS622	How Factors in Creditor Countries Affect Secondary Market Prices for Developing Country Debt	Sule Özler Harry Huizinga	March 1991	S. King-Watson 33730
WPS623	World Bank-Supported Adjustment Programs: Country Performance and Effectiveness	Vittorio Corbo Patricio Rojas	March 1991	A. Oropesa 39075
WPS624	Choosing Policy Instruments for Pollution Control: A Review	Gunnar S. Eskeland Emmanuel Jimenez	March 1991	A. Bhalla 37699
WPS625	How Trade and Macroeconomic Policies Affect Economic Growth and Capital Accumulation in Developing Countries	Ramon Lopez	March 1991	K. Cabana 37946
WPS626	The Macroeconomics of the Public Sector Deficit: The Case of Colombia	William Easterly	March 1991	R. Luz 39059
WPS627	The Role of Institutions in Poverty Reduction: A Focus on the Productive Sectors	Sharon L. Holt	March 1991	WDR Office 31393
WPS628	The Indonesian Family Planning Program: An Economic Perspective	Dov Chernichovsky Henry Pardoko David De Leeuw Pudjo Rahardjo Charles Lerman	March 1991	O. Nadora 31091
WPS629	An Atheoretic Evaluation of Success in Structural Adjustment	Patrick Conway	March 1991	D. Ballantyne 37947